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Operations "Dragoon"—Planning and Landing Phase

BRIGADIER GENERAL REUBEN E. JENKINS

"DRAGOON," the operation against the south of France, is not well known because it competed for publicity with the amazing and overwhelming Normandy offensive. It is natural that the "Secondary Attack" would find itself relegated to "pages 2 and 10" of the press at such a time. However, this operation will be found on the "front page" of military history.

For results as a "Secondary Attack" it is without parallel. It liberated southern and southwestern France with a speed that surpassed three-fold estimates of the most optimistic. In daring and speed of maneuver it is unsurpassed. In measure of surprise achieved, it is equaled only by Anzio.

Planning the Operation

During their conference at Quebec in August 1943 the Combined British and United States Chiefs of Staff decided that an invasion of southern France from North Africa, either concurrently with or shortly after the cross-channel assault (see Map No. 1), would be of material assistance to the main attack, "Overlord." It would engage the Germans in southern France and prevent their movement against the main attack. It might prevent movement of other German formations from central France towards Normandy. The Germans might be compelled to move reserves from central and northern France to meet a southern invasion. Furthermore, if surprise could be achieved with sufficient force, the whole of southern and southwestern France might be liberated quickly by a double envelopment from the Cherbourg and Marseille areas.

The Combined Chiefs of Staff requested General Eisenhower, commanding Mediterranean Theater, to submit to them his appreciation of the proposal. General Eisenhower's estimate was the basis for further discussion by the Combined Chiefs of Staff in Cairo in late November 1943, upon the conclusion of which it was decided that the operation would be undertaken.

General Eisenhower was directed to prepare a plan for an invasion with a force approximating ten divisions consisting of all available rearmed French troops and such American units as could be spared. The code name "Anvil" was given the operation. No assurance was given that the assault shipping and craft available would be more than that required for an assault landing by two divisions.

After the task had been analyzed in detail at AFHQ [Allied Force Headquarters] the Combined Chiefs of Staff were advised of the necessity for sufficient assault shipping and craft for an assault by no less than three divisions. Although there was no firm commitment in this regard, AFHQ was assured that every effort would be made to provide the resources required.

Headquarters Seventh Army, then in an inactive role in Sicily, was designated to command the expedition and was moved secretly to Algiers, where it initiated detailed planning.

In the meantime, General Eisenhower had been assigned to command the European Theater of Operations. General (now Field Marshal) Sir Henry Maitland Wilson was his successor in the Mediterranean Theater.

The opportunity to launch "Anvil" against southern France concurrently with or immediately after "Overlord" was lost, due to the heavy demand upon all available assault shipping and craft for "Overlord" and its buildup, and to the great demand for men and material for the campaign in Italy. Thereafter, an exchange of encouraging and discouraging messages with the Combined Chiefs of Staff regarding "Anvil" was "The Event" of every week at AFHQ. The Supreme Allied Commander, Mediterranean Theater, was advised to make every effort to be prepared to launch the operation at a later date. Hence, everything was kept in readiness for the opportunity which would be presented once the resources required became available.

After "Overlord" buildup was assured, assault shipping and craft would be available for "Anvil." The great success of the spring offensive in Italy launched on 11 May and the resultant capture of Rome indicated that the required troops could be spared from Italy by July.

But final decision was not reached without difficulty. Operations in Italy to clear the area south of the Arno River were highly successful, and some held that if all resources in men and material remained available to the commander in Italy, he could clear all Italy before winter. Thus "Anvil," competing with operations in Italy for resources, received little sympathetic consideration from those tempted by local success or those who saw in the Italian campaign a strategical effort of primary importance. However, there were many who recognized the vital importance of "Anvil" and insisted that it be launched even at the expense of halting the Italian offensive.

General Wilson cabled his views on Allied strategy in the Mediterranean to the Combined Chiefs of Staff and informed them that, in his opinion, the ultimate decision regarding "Anvil" must rest with General Eisenhower. In late June 1944 a conference was held in London, attended by representatives of the Mediterranean Theater. General Eisenhower insisted that "Anvil" be launched at the earliest possible date. He released the assault shipping and craft necessary to complete the lift for a three-division assault. The Combined Chiefs of Staff then directed AFHQ to complete preparations and set 15 August as a target date.

Final Preparations Begin

All that now remained to be done was to complete special training and implement prepared plans. The VI American Corps (3d, 36th, and 45th Divisions), commanded by then Major General Lucian K. Truscott, and the II French Corps [3d Algerian Infantry Division (3DIA), 4th Moroccan Mountain Division (4DMM), 1st Motorized Infantry Division (1DMI), and 2d Moroccan Infantry Division (2DIM)], had already been ordered withdrawn from the battle in Italy in anticipation of the order.

The I French Corps [1st Armored Division (1DB) and the 5th Armored Division (5DB) in North Africa, the 9th Colonial Infantry Division (9DIC) in Corsica], the First Special Service Force (United States-Canada), and several French Commando units had been alerted.

A provisional airborne division had been formed in Italy composed of two American regimental combat teams (one parachute and one glider) and one British parachute and glider brigade.

French units were under French Army "B," commanded by General de Lattre de Tassigny. The entire force was placed under the Seventh Army.

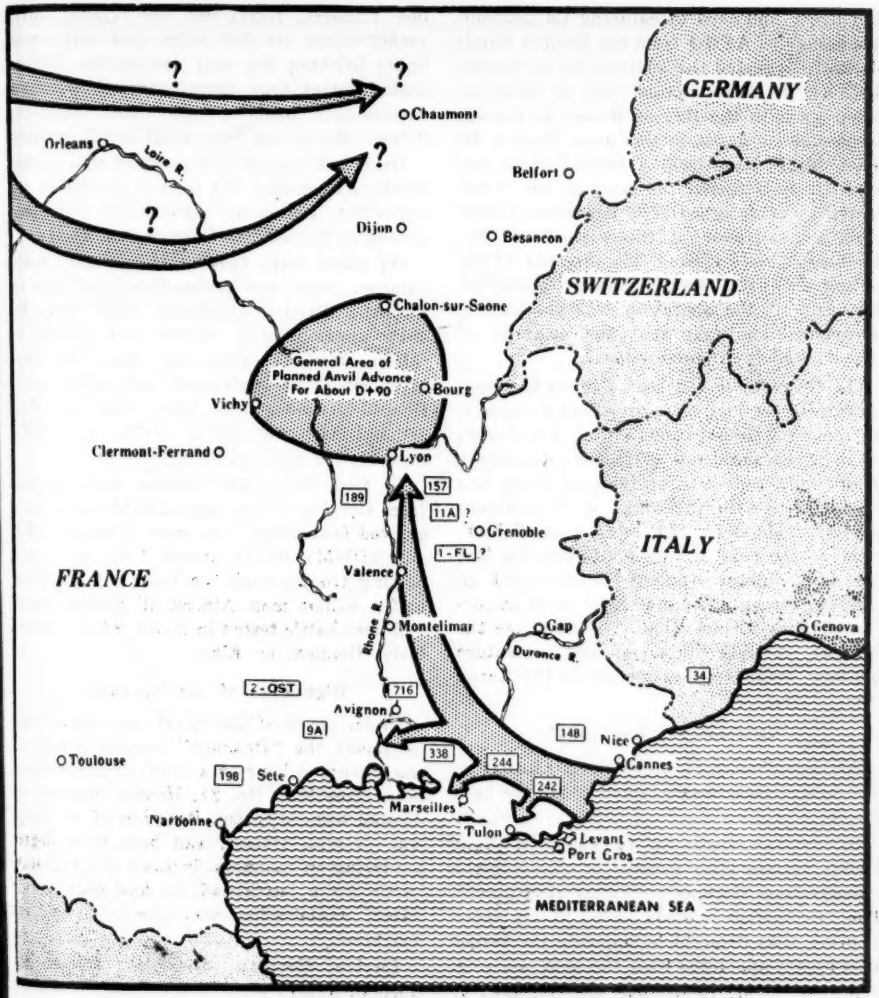
The VI Corps, with one combat command of 1DB attached, was assigned to the beach assault. It (less the CC of 1DB) assembled in the Naples area. The airborne division, which was to carry out an airborne assault, assembled in the Rome area.

Each beach assault division was given about twenty-one days of ship-to-shore and shore-to-shore assault training and a formal rehearsal. The airborne division continued training until time for final loading. The French divisions were refitted and given special training.

Liberty ships had to begin loading early to meet the target date. The plan called for approximately one hundred and fifty to be loaded by 10 August from the limited dock space available in Italy and North Africa.

Relatively few knew they were going to invade France, though many may have suspected it. Knowledge of the target area was limited to senior commanders, staff officers and key enlisted men whose duties required them to know the plan at the time. Secrecy was vital. The bulk of the officers and men were briefed after sailing.

The west coast of Italy and the ports in North Africa were now alive with an activity which German air reconnaissance could not miss. The Germans knew something was up, but the violence of operations in Italy threw



Map. No. 1.

them completely off balance strategically. They decided that the activity observed was the overture to a tremendous seaborne expedition against the Italian port of Genoa to turn the Germans off the Appennines and drive them out of Italy. During one broadcast, "Axis Sally" sent a special message to the men of the 3d, 36th, and 45th Divisions, saying that she knew they were training near Naples for an operation against Genoa. She promised that they would be accorded a warm reception.

As preparations were being completed, "Overlord" renewed its offensive. The Third Army broke through and raced east, south, and west, sealing off Nantes, St. Nazaire,

and Brest, and even threatening La Rochelle. A message to AFHQ from the British Chiefs of Staff suggested the advisability of moving the "Anvil" force against one or more selected ports in the Bay of Biscay as quickly as possible to assist in this area. Such a decision would have been a serious error and would have defeated the purpose for which "Anvil" was designed. The American Chiefs were not in favor of the suggestion. The Combined Chiefs of Staff then directed AFHQ to "get on" with "Anvil." Shortly thereafter the name of the operation was changed to "Dragoon," for fear that the meaning of "Anvil" had been compromised.

The Germans in southern France had been harassed for a long time by Allied air power. During final preparations Allied Air Forces began a thorough and systematic demolition of all roads, railroads, bridges, air fields, and beach defenses in the south of France and in Italy from Sete, 100 miles west of Marseille, to the east of Genoa. During the last five days, fighter bombers concentrated on every known gun emplacement and important defense within range. To encourage the Germans in their erroneous and premature opinions, emphasis was placed on the Genoa area.

"Dragoon" Is Launched

"Dragoon" convoys sailed on schedule from Africa and Italy and assembled for the task ahead.

In the late evening of 14 August a slight Mediterranean haze assisted in shielding the convoys from German reconnaissance planes. This tremendous armada sailed at top speed in order that it might be opposite the target area by the appointed hour the next morning.

At first light, 15 August, the Germans at Genoa were at alert for an attack. The Germans along the French Riviera were suddenly smothered with violent naval and aerial bombardment. As the mist lifted from the water, there, farther than the eye could see, were 2,110 cargo and personnel ships, assault ships and assault craft.

Deployed in and around this great mass was the fire support—five battleships, twenty-one cruisers, thirty-two destroyers, thirty rocket ships, six flak ships and seven gunboats belching fire and destruction. Behind them nestled nine escort carriers with approximately three hundred and thirty-five fighter planes, and four antiaircraft cruisers.

Overhead roared 610 medium and fighter bombers to unload 774 tons of bombs on the defenders. Following were 3,936 additional planes to harass the Germans on D-day.

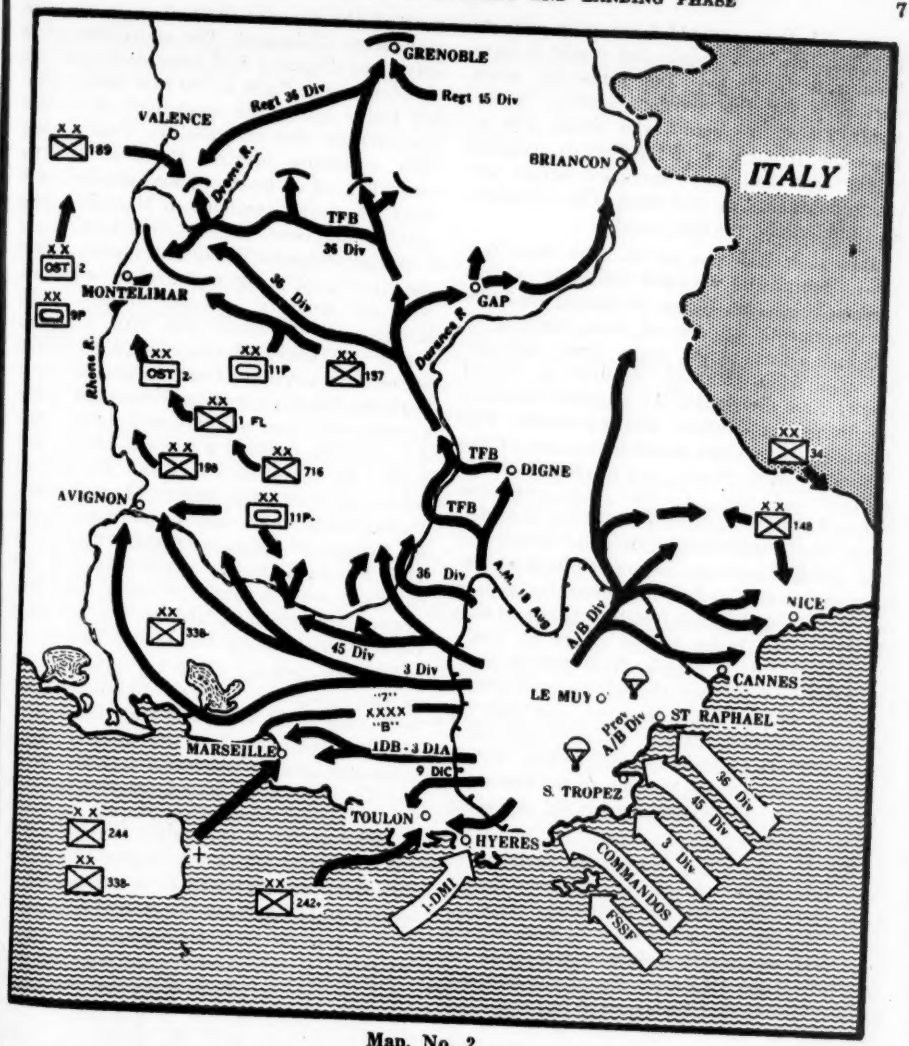
Off shore were 151,000 troops and 19,400 vehicles, guns, and tanks. Overhead was an airborne division of almost 8,200 men. By dark approximately 80,000 men would be ashore. Within seventy-two hours the Germans would be confronted with seven experienced divisions (3d, 36th, 45th, 1st Provisional Airborne, 3DIA, 1DMI, and 1DB), superbly led and full of fight.

In four days 9DIC would have arrived from Corsica. In ten days 2DIM would have arrived from Italy. Two more divisions (5DB and 4DMM) would arrive later with supporting troops, until the force totaled about half a million men. Almost all combat troops had been battle tested in North Africa, Sicily, Italy, Corsica, or Elba.

Highlights of the Operation

Under cover of the naval and aerial bombardment the "Dragoon" assault struck at the appointed hour on a front of about thirty miles (see Map No. 2). Hostile reaction indicated total surprise. Reaction of VI Corps was prompt, violent, and bold to a degree bordering on rashness. Instead of a full-scale battle for a beachhead, as had been anticipated, exploitation was opened from the beachline.

Twelve German divisions (Nineteenth German Army) were in southern France and one along the Italian border. There were also several separate battle groups, beach defense units, assault gun brigades and regiments of various types. Included were two highly mobile infantry divisions and two Panzer, one of which (9th) was at reduced strength. At least two infantry divisions should have brought their bulk against the assault waves of the VI Corps promptly, one



Map. No. 2.

more (mobile infantry) should have entered the battle before dark of the first day, one more (infantry) by noon of the second day, and at least two more (11th Panzer and 34th Infantry) by daylight of the third day. With such a hostile buildup, "Dragoon" would have taken on a different aspect promptly.

Had the Germans sealed off "Dragoon," they could, and undoubtedly would, have maintained themselves in southern and southwestern France on the flank of "Overlord" for a considerable length of time. "Overlord" would not have been able to seize and hold a line extending to Belfort Gap.

The VI Corps should have been able to hang on to a beachhead—but would it have been able to provide the maneuver space necessary for the divisions coming in behind? There are many who think that at least one, if not two, of the French divisions might have had to be launched across unsecured beaches on the flank. One shudders to think of the possible results.

But such was not to be. The first few hours found the forward elements of two German divisions being decimated and the rear elements of one of them making a supreme effort to get away from our airborne division. Dark of the first day found one of these divisions and a separate regiment eliminated as effective fighting forces. The 148th Division made great haste east of the landing area to "block" any advance towards Cannes and Nice. To the west, confusion reigned. The reinforcing divisions expected from the Toulon and Marseille areas did not put in their appearance. Only weak resistance was offered in that direction as late as the third day, by which time the 148th Division was being ripped apart by tank-infantry-artillery attack from the ground, by flanking fire of naval craft from off shore, and by fighter bombers from overhead. It decided to seek safety in the Alps and initiated a withdrawal during which it lost more than half of its command. The 34th Division on the Italian border did not come to its assistance.

By the fourth day the nearest divisions to the west were scampering to cover Toulon and Marseille. One of them was engaged east of Toulon and encircled in that city by the fast moving French who were now on the left of the VI Corps. About one and one-half divisions beat the armored and motorized columns of the French and the left of VI Corps to the eastern exits of Marseille, only to be encircled in that city. Three American divisions and one French Armored Combat Command were cutting a path on the right of the French through demoralized elements trying to save themselves.

By morning of the fifth day the full import of the disaster dawned upon the German High Command. The equivalent of at least two divisions had been destroyed, one division was in flight to the east after suffering heavy losses, the equivalent of at least one division was encircled in Toulon along with a strong Marine Brigade, and the equivalent of at least one and one-half divisions was being encircled in Marseille along with strong coast defense detachments and a Marine Brigade. Thus, with almost half of the Nineteenth Army encircled or wiped out, with the southern invasion forces growing stronger by the hour, and with Allied air power of overwhelming violence playing havoc with anything German that moved in daylight, the German High Command decided to withdraw from southern and southwestern France. This decision was made all the more urgent by the offensive of the Third Army which was now gathering speed southwest of Paris, headed east and threatening to seal off France as far east as Belfort Gap. The 11th Panzer Division, which had not been engaged, was ordered to cover the withdrawal of remnants, and of the remaining German divisions up the Rhone Valley.

But the decision came too late. Not one of the remaining German divisions escaped unscathed. The Germans who escaped the holocaust visited upon the area extending from the landing beaches to the Rhone and the Durance were struck by overwhelming air power of such violence as to render orderly retreat up the Valley of the Rhone in the long daylight hours impossible. Confusion and demoralization were followed by the crowning disaster at Montelimar as air power and the wide encircling maneuver of VI Corps struck the Germans near the head of their fleeing columns. Even the 11th Panzer Division failed to get in position to cover them properly. With its forward elements arriving belatedly in the Avignon area to block the direct pressure, its rear elements were suddenly struck in flank at Montelimar as they moved to cover the masses fleeing the Valley of the Rhone. Disintegration of the German forces in southern France was

complete. Only the long lines of supply of "Dragoon" and the acute shortage of trucks which seriously restricted tactical movements of troops saved the German Nineteenth Army from complete annihilation in the Valley of the Rhone.

The eleventh hour employment of the atomic bomb has done more than any other single incident to focus the attention of the Army as well as the public on the possibilities of scientfic research and development and its application to military uses, so that we can rest assured that interest and attention to this requirement will be kept alive in the immediate future. Nevertheless it is up to the Army to set its long-range development objectives down in specific terms so that the Technical Services and other agencies charged with this development can undertake vigorous programs of proper dimensions to achieve the desired results. The Army Air Forces have taken the lead in this respect. They have an elaborate, comprehensive program, for development of the most modern type of aircraft and accessories as well as the several types of guided missiles which offer such great promise.

Major General Russell L. Maxwell

The complex nature of modern warfare requires careful and detailed planning, long in advance of the actual operations. Once the general strategy of the war and its several successive operations have been determined, it is necessary to make detailed logistical plans covering the requirements in terms of military units, equipment and supplies and the means available for transporting these to the area where they will be employed. In fact such strategic plans are dependent on logistics. Logistic planning balances requirements against resources. If the available units, the trained personnel, the supplies and equipment, or the means of transportation, are not adequate to support the strategic concept and cannot be secured in time for its execution, the strategic plan must be altered until the two are in gear. The next step is to secure the necessary supplies and equipment and to assure that they are delivered with the troops, at the places, at the times, and in the quantities required.

General Brehon Somervell

The Fall of the Philippines

Compiled by COLONEL ANDRES LOPEZ, *Infantry*, from the Press Releases of the Commander in Chief, United States Army Forces, Pacific.

ON the morning of 8 December 1941, on receipt of the news that Hawaii had been attacked, General MacArthur issued the following statement: "The American command here has been alerted and all populations are in readiness for defense." War was on.

On the same day the enemy launched a series of air attacks on Clark Field, followed on the 9th by an early morning raid on Nichols Field. This was the prelude to an enemy attack with land troops supported by naval elements and air forces, and on 10 December the enemy appeared in heavy force off the north coast of Luzon extending from Vigan to Aparri and began landing operations.

As the first week of military operations came to a close, the situation, both on the ground and in the air, was well in hand. The enemy had carried out fourteen major air raids on military objectives in the Philippines, but had paid dearly in the loss of transports, planes and troops, and at least two battleships badly damaged as a result of action by our air and ground forces. An enemy landing attempted in the Lingayen area was repulsed by a Philippine Army division, but unopposed landings in limited numbers were effected at Vigan, Legaspi and Aparri. Enemy naval units, troops and matériel on the ground were bombed effectively by our air force in the Vigan and Aparri areas, hampering landing operations, sinking four enemy transports and seriously damaging three off Northern Luzon. Individual deeds of heroism and bravery on the part of American and Filipino ground troops and air units marked the week's operations. The total enemy air losses from all causes during the week was not less than forty planes actually accounted for and probably many more which could not be verified.

The Japanese bombing air technique was perceptibly deteriorating. Their original effort was superior in every respect but, under the heavy punishment they received, a growing tendency towards mildness in the discharging of their bombs was apparent.

The splendid morale of our military forces and of the entire population was most commendable. As the war progressed, activity on the northern and southern fronts increased as Japan sought to gain a foothold in the Philippine Archipelago. Ground and Air Commands of the United States Army Forces in the Far East struck back with increasing fury at the invaders. Heavy fighting was in progress in Davao, on the extreme southern front, where the enemy had landed in force, and on 21 December 1941 the entire headquarters of the Philippine Army was inducted into the service of the United States, placing all military units in the Philippines under the direct control of General MacArthur.

The enemy's plan was beginning to develop. Enemy air activity increased in spite of the gallant efforts of our reduced air force and it was apparent that we were confronted with a major expeditionary drive aimed against the Philippines.

On the morning of 22 December 1941, a huge enemy fleet estimated at eighty transports appeared off Lingayen Gulf and, on the 23d, several transports were sighted off Batangas and forty off the coast of Atimonan. During the night the enemy landed in heavy force in the vicinity of Atimonan.

In the meantime, fighting was going on in the north.

In the Lingayen sector heavy fighting, including tank combat, developed in the vicinity of Santo Tomas. At one point enemy destroyers and transports were driven off by our heavy guns and a landing prevented.

During the succeeding few days the enemy increased the tempo of the attack on both the northern and southern fronts and, al

though our troops offered a stubborn resistance, fighting against great odds and greatly outnumbered, the enemy continued to land reinforcements. Enemy air activity continued with bombing especially concentrated on the Manila Fort Area. In order to preserve the city from the ravages of war and to increase the possibilities of defense in the outlying areas, Manila was declared an open city on 26 December. However, it suffered another air bombardment on the 27th. It is worthy of note that prior to this, the Japanese did not attempt to attack civil installations from the air, but as soon as the Army, including antiaircraft protection withdrew, they immediately raided, hitting all types of civilian premises.

On 31 December, after a day of relative quiet, the enemy launched a general offensive driving in great force from both north and south and using great quantities of tanks and armored units. Dive bombers practically controlled the roads from the air. Our lines were pushed back.

In order to prevent the enemy's infiltration from the east from separating our forces in Southern Luzon from those in Northern Luzon, the southern force had for several days been moving north and, on 1 January 1942, successfully completed a junction with the northern force in spite of hostile mechanized efforts to prevent the junction. This movement uncovered the free city of Manila which had been completely evacuated by our forces and had no practical military value. However, the entrance to Manila Bay remained completely covered by our forces and its use denied to the enemy.

On 2 January, the enemy occupied Jolo and a small force for police duty occupied Manila.

Enemy air activity increased. Fort Mills was raided for five hours on the 3d and the area north of Manila and Corregidor was heavily bombed on the 4th. Although he was sustaining material losses from our antiaircraft, the enemy's activity in the air continued unabated.

On the ground, after a short relapse, fighting was resumed in the north and, on Sunday morning, 5 January, the enemy launched a heavy attack in which he was repulsed with an estimated 700 dead, the most serious reverse he had yet sustained. His pincer movement from north and south designed to crush our forces was closed but our troops were not in the jaws of the trap. His strategy in this respect failed completely.

The enemy's cunning deceit, exhibited in his air raids, which he apparently concentrated on military objectives to lull the people into false security, suddenly changed, and defenseless towns like Baler, Santa Rosa, Colamba, and Tarlac were mercilessly bombed, razed to the ground with pilots strafing civilians in Arayat, Camiling, San Fernando and other towns.

After days of heavy fighting all along the front with our front lines bombed and strafed continuously, the intensity of the hostile attack subsided somewhat while the enemy moved troops towards the front in preparation for a major attack.

On 11 January, the enemy launched a concentrated attack on our right which was bloodily repulsed. This was followed by an artillery duel along the entire line in which our counterbattery was particularly effective silencing eleven hostile batteries and forcing the enemy artillery positions to the rear along the entire front. The hostile attack received a general set back with comparatively slight losses to our forces. However, aggressive enemy activity continued with varying intensity with air attacks apparently concentrated on the Corregidor-Bataan Area in spite of heavy losses exacted by our antiaircraft.

In the meantime, uneasiness on the part of the Japanese Military was beginning to show in exaggerations in their propaganda. Their comments with reference to military forces frequently contained little of the truth and at times were almost fantastic. Their attempt to suppress the use of private radios in occupied areas was a clear indication of fear of truth as broadcast from American and English stations despite great quantity of radio propaganda from Tokyo. The issuance of a proclamation by the Japanese Com-

mander warning the population that any act resulting in injury or any attempt to inflict injury upon Japanese soldiers or individuals would be punished by death if found, or the holding of ten influential hostages, if not found, was a sharp contrast to the cajolery used in the propaganda prior to the occupation of Manila. They proclaimed that the war was to emancipate oriental peoples from white subjection, but their looting and devastation was systematic and countrywide. Wherever they went they spread death, destruction and desolation. In Manila they closed the Philippine commonwealth offices, ordered Filipino judges not to try cases, placed public works and communications under their direction and assumed all government functions formerly exercised by Filipinos. It was evident that the Japanese neither trusted nor respected the Filipinos. In the occupied areas the Filipinos were already practically reduced to slavery. Examples of Japan's "new order" were everywhere apparent. Equipment was summarily appropriated, owners dispossessed, residents evicted, farmers formed into labor groups but deprived of their crops. The economic balance of the Philippines was completely disrupted by Japanese greed and avarice.

One of the most horrible features of the Japanese occupation was exhibited in the rape and violation of all women. In the countryside this was completely universal. Japanese officers apparently made no attempt to restrain their men in this respect. In Manila a fair degree of control was at first exhibited, however after nightfall no woman was safe on the street.

American and English nationals in Manila were herded and crowded in a manner which would bring shame on any truly civilized nation. Forced into army trucks by the butts of Japanese guns, they were largely carted off to concentration camps without notice. In the largest concentration camp in Santo Tomas University, over three thousand men, women, and children were crowded in a space poorly equipped for twelve hundred. Families were separated. Sanitation and facilities for medical attention were deplorable. The homes of the interned were scientifically searched and looted. Certain prominent individuals were held incommunicado. The lot of these unfortunates was worse than that afforded prisoners of war of any other country. Not even the ordinary conventions of the Geneva agreement had been provided. On 15 January, Japan announced through Switzerland, that she would abide by the international captured prisoners convention. Her brazen deceit in making this announcement to the world was illustrated on the battlefield of Bataan several times. After a successful counterattack by our troops on 12 January the body of a Filipino scout was found in a stream where he had been thrown to drown after being bayoneted several times while his hands were bound behind his back. Other cases of this nature were reported.

Stories of the Japanese treachery, subterfuge and use of fifth columnists prior to the war became more complete daily. Dozens of Japanese army officers previously domiciled in the Philippines as civilians returned to Japan just prior to hostilities carrying complete reports on all landing fields and all landing beaches. Captured maps and documents indicated very comprehensive information. When their attacks were launched, their bombers were guided on a radio beam of stations of sympathizers located near our military objectives. From 4 December on, American pursuit intercepting planes located hostile Japanese bombers from twenty to fifty miles out at sea each night. Although the enemy planes always turned back before actual contact was obtained, their actions made our troops anticipate an attack. It is of historical interest that the last of these night efforts was intercepted and turned back at the exact hour of the delivery of the attack on Hawaii.

The enemy continued to expand its activities and by 21 January, USAFFE (United States Armed Forces Far East) activity covered the entire Philippine Archipelago. Enemy reinforcements continued to land in

Luzon and pressure increased all along the line.

For several days the enemy had been building up for a prepared attack on our left, bringing in fresh troops under the protection of their navy. Their air preparations were heavy. In addition, night efforts at penetration were made along the Subic Bay coast in an endeavor to outflank our entire position. The attack was launched on 24 January and under its pressure we were forced to give ground with some loss. At this juncture General MacArthur launched a counterattack from his right with smashing success. His powerful concentration of 155-mm guns was deadly. Our infantry found the enemy completely disorganized in this area. He left hundreds of dead on the field and quantities of supplies and equipment. The enemy troops employed in this desperate venture were his best. They were shock units especially trained and selected and resisted with the courage characteristic of Japanese troops but at the end those who were not destroyed were glad to surrender.

The situation was now stabilized with some action in the vicinity of Subic Bay and limited air activity. Headlong hostile infantry attacks on both our right and left flanks were broken up by our artillery with heavy losses.

The end of January was characterized by heavy fighting. On our east and west sectors, frontal attacks launched by the 16th and 65th Japanese Divisions failed completely. These attacks were mutually coordinated and timed with desperate thrusts by a picked group—known as the Tatori group—against the west coast aimed at what they mistakenly thought to be our flank and rear. Our infantry supported by artillery and mortar fire forced the invaders back to the coast. Those who attempted flight by sea were drowned; and the rest destroyed or captured.

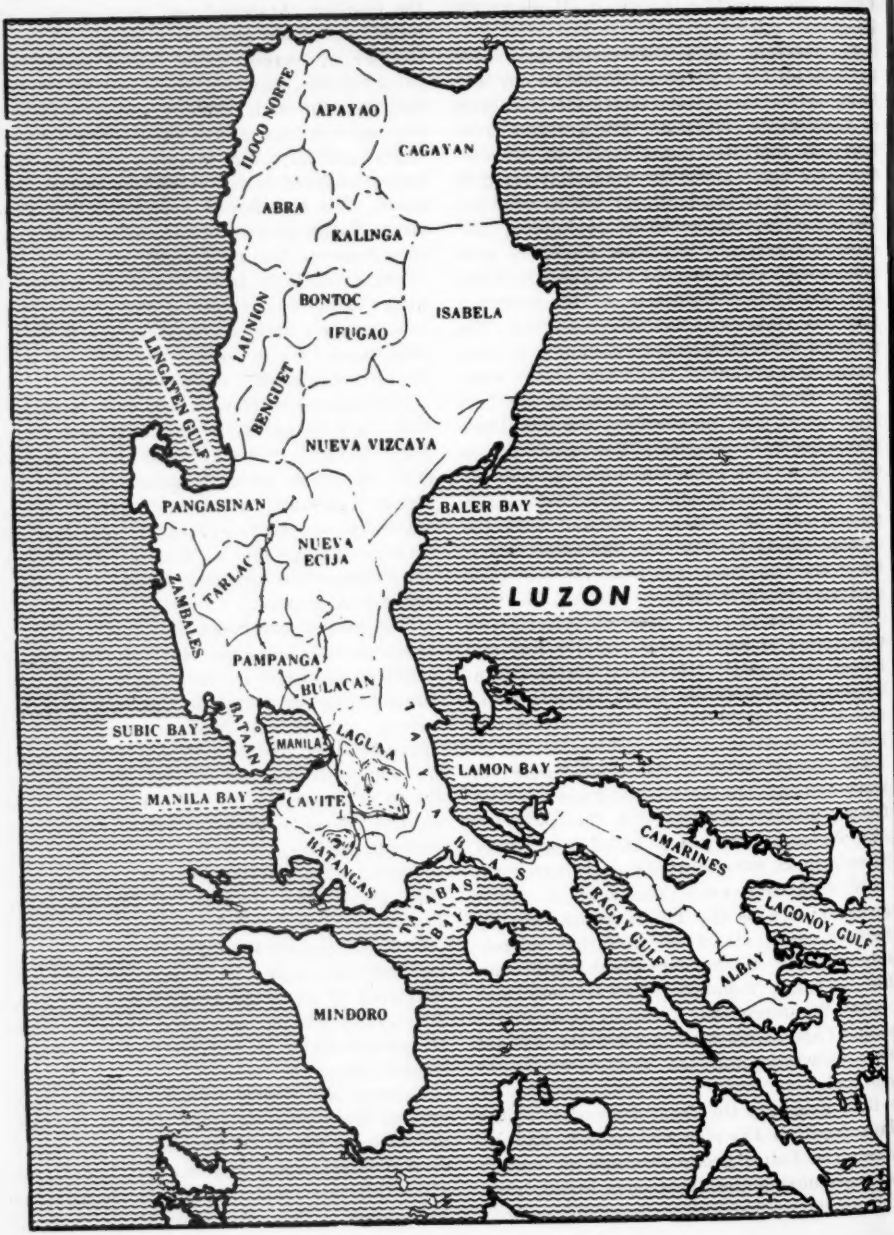
By 3 February the frontal pressure of the Japanese 16th Division on our left had relaxed. The Tatori group resumed its landing attempts during the night on a broad front. Our artillery frustrated a first raid early in the evening. A second and more serious attempt was made again at midnight. A large number of barges under naval escort approached the coast but were met by our attack aviation with bombing and strafing and our beach defense forces came into play with heavy artillery and machine-gun fire. The enemy suffered heavy casualties in men and boats. This constituted another telling blow at the Tatori group. On our right, after stopping General Nara's frontal attack by the Japanese 65th Division, aimed at driving a wedge between our forces, one of our divisions made a sudden counterattack overrunning three lines of enemy trenches and capturing considerable equipment.

The savage battling which had characterized the fighting of the last two weeks subsided. Infantry fighting was limited to patrols. Artillery action remained heavy. Air action continued as usual against heavy odds. An appeal to surrender addressed to General MacArthur by General Aguinaddo, old Filipino revolutionary leader, on 1 February was ignored.

The enemy continued to land reinforcements in the Lingayen Harbors. His heavy artillery emplaced in the Cavite area, presumably for the attack on Corregidor, maintained a constant fire on Forts Drum, Hughes, Mills, and Frank, and was engaged by our batteries. Heavy infantry fighting flared at intermittent points along the lines as the enemy infiltration efforts continued without success.

Behind the American battle lines in Bataan there were stretches of forests, farm lands, and rice paddies. Simple villages, which once peacefully clustered around graying churches, were now in smouldering ruins shattered by Japanese aviation and artillery. The simple people, who once lived in those sleepy hollows were now huddled in refugee camps behind the lines.

General MacArthur was fighting the war on two fronts: the military and the civilian propaganda front. On the latter he rigged several broadcasting stations and three times a day his news and propaganda flooded the Philippines. This propaganda was unique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ALBAY
MINDORO

and had never been practiced before in any of the famous and extraordinary efforts which had been made throughout the world in this line. His concept was very simple and consisted of telling the truth and only the truth. The Japanese desperately attacked General MacArthur along this line by counter-propaganda and attempts to jam the air, showing their fear by the intensity of their resentment. Their failure to win the confidence of the Filipino people caused them to resort to the only solution they understood—force. The press was throttled under pain of severe punishment. No newspapers, magazines, pamphlets, etc., could be published without the authority of the military. All subject matter was censored by the military.

From the start, Japanese propaganda indicated that the Japanese would have rather made friends of the Filipino than any other people they had attempted to subjugate. But actions speak louder than words; the invading hordes could not control their avarice and greed. This was particularly apparent in their appropriation of foodstuffs. Any amount, no matter how small, sooner or later fell into the hands of the grasping aggressor. Within six months the populace would be starving not theoretically but literally. Hundreds of thousands of Filipinos in the occupied areas were doomed if the attitude of the enemy was to continue.

On 28 January President Quezon issued a proclamation announcing the loyalty of the Filipino people to America and the determination to continue fighting side by side with the United States until final victory.

Weeks of hard fighting had made veterans out of the Philippine Army soldiers. Their training in the difficult school of battle experience had steadied them and developed their resources.

The Philippine Army is a citizen-soldier army. All groups and communities, through the draft system, contributed equally to its personnel, Christian, Mohammedan and Pagan, scholar, farmer and laborer all contributed equally to its great and paramount civic duty of preparedness. The units were localized and one of the most picturesque was composed of Igorotes, the Pagan people of the Bontoc Mountain region, all excellent fighting men. Their courage is best exemplified by their action in one of the enemy's desperate attacks when his Twentieth Infantry Regiment, reinforced, rolled over an Igorote Company. To a man the Igorotes died in their fox holes without flinching and without whimpering. In order to restore the situation the High Command immediately ordered a counterattack with tanks supported by infantry. The infantry were Igorotes, eager to even the score for their lost tribesmen. The bamboo jungle and the heavy irregular terrain were almost impenetrable and made it impossible for the tanks to operate. But the limitless resourcefulness which had been one of the outstanding characteristics of the Philippine Army immediately came into play. Without a word the Igorote commander hoisted his men to the tops of the tanks to act as guides so the tanks could work their way through the matted morass of underbrush, thicket, and trees that blinded them. The Igorote soldier on top of the tank was the eyes for the American soldier driver below. Forward they went with an Igorote on the top of each tank. Bataan had seen many wild mornings but nothing equal to that. No quarter was asked and no quarter was given. No guns, no thicket, only death could stop that mad rush. Of all the bloody spots on the Peninsula, that proved to be the bloodiest. When the attack was over, what was left of the tanks and the Igorotes was still there, but the Twentieth Japanese Infantry Regiment had been destroyed.

Another Filipino organization which distinguished itself was the Philippine Scouts. Organized during the days of the American occupation, they constituted a part of the Philippine division in our army prior to the war. Every combatant organization of the Philippine Scouts was engaged in combat on numerous occasions after 8 December and proved themselves to be excellent soldiers.

By the middle of February activity on the fronts was reduced to local encounters and artillery duels. The enemy was apparently regrouping his forces after the bloody re-

pulses and defeats he had suffered and as the month came to a close normal activities prevailed on all fronts. In Bataan, the fighting had, temporarily at least, become positional. After several sharp encounters the enemy had definitely withdrawn from one to eight kilometers to fixed positions from which he could either engage in seige operations or build up another attack. Meanwhile his casualties and sick list increased day by day. In the North Luzon front our mountain troops had forced him to evacuate the Abra Valley from Cervantes to Bengnet. Artillery duelling continued between the harbor ports and the enemy Cavite shore batteries. His defensive attitude showed that his heavy losses had shaken him. He was beginning to show signs of exhaustion.

As the enemy continued on the defensive on the fighting front, his activity on the propaganda front was intensified, openly inciting the Filipino troops to turn against and kill their American comrades in arms and then surrender. This propaganda, however, fell on deaf ears, the morale and hope of the Philippine people remained undaunted and the civilian resistance against the invaders grew in intensity. The loyalty of the Filipinos to the cause of freedom and democracy remained unbreakable.

To the enemy's defensive attitude General MacArthur reacted with an offensive and on 4 March his air force launched a surprise attack on Subic Bay sinking three transports and several smaller vessels with heavy loss of life and damaging enemy installations.

President Roosevelt ordered General MacArthur to Australia by the middle of March to assume the new Southwestern Pacific command for the United Nations. General Wainwright took over command of the Philippines.

The Japanese assault on Bataan at the beginning of April was made against men worn down by months of siege, by malnutrition and sickness, and cut off, as they themselves had known since President Roosevelt's speech of February 1942, from any possible relief. The Japanese attack was overwhelming and the enemy broke through. On 8 April after a conference with his commanders, General Wainwright agreed that further resistance was hopeless, and on 9 April the tattered and starving remnants of the Army of Luzon surrendered. Major General Edward P. King, Jr., who was in immediate command on Bataan, surrendered a total of between 35,000 and 40,000 American and Philippine troops, many of them wounded. In addition, there were about 25,000 civilians on Bataan, nearly all of them Filipinos, at the time of surrender.

The surrender of Bataan sealed the fate of Corregidor and its satellite fortresses in Manila Bay, although these held out until 7 May. Like Bataan, Corregidor was without air spport. Unlike Bataan, it was subjected to extremely heavy plunging fire from 240-mm batteries emplaced in the mountains of Bataan Peninsula, as well as to intensive air bombardment. A battle of thirty-three hours preceded the final surrender, with Japanese shock troops swarming across the narrow channel between Bataan and Corregidor during the night to land on the shell-torn beaches of the rocky islet. The beach defenses had been completely annihilated and heavy casualties had been caused by the intensive bombardment. For, contrary, to the previous impressions which were given, officers who escaped from Corregidor earlier in the fighting have now made it clear that practically all of the fortress's guns were emplaced in the open in obsolescent mountings, that the famous tunnels in the rocks were virtually uninhabitable, and that in consequence the defenders of the fortress were constantly exposed.

And so the short-lived and disastrous Philippine campaign came to an end on 7 May as General Wainwright "haggard from lack of sleep and worry," as the Japanese described him, sought the Japanese commanders to ask terms. They were hard: unconditional surrender of all armed forces in the Philippine Islands. Communications with the Philippines ended on 6 May and 11,574 soldiers, sailors, marines and civilians, Filipinos and Americans, became Japanese prisoners when Corregidor and its three companion forts fell.

COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

FORT LEAVENWORTH, KANSAS

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MILITARY REVIEW

Command and General Staff School, Fort Leavenworth, Kansas

The Liberation of the Philippines

MAJOR GENERAL CHARLES A. WILLOUGHBY, ***General Staff Corps***
Assistant Chief of Staff, G-2, United States Army Forces, Pacific

THE great cycle: Manila-Melbourne-Manila was completed. In a brilliant campaign, slicing the inchoate mass of Japanese troop concentrations into isolated segments, MacArthur destroyed the myth of Maiji and broke the hypnotic spell of an Asiatic Confederation under the aegis of Japanese Military conquest; and symbol of the invincible Imperial Army, the arrogant conqueror of Singapore, General Yomoyuki Yamashita, suffered the most humiliating military defeat in the annals of Japanese history; his conduct of operations from Leyte to Luzon was inept, hysterical, second-rate.

In the period 1942-44, the Japanese General Staff poured tremendous amounts of troops, planes, and shipping into the Southwest Pacific area. It can be said, without exaggeration, that it was on this particular front that the Japanese war machine received not only its first definite setback at Milne Bay and on the Kokoda Trail, but that it bled itself white thereafter, in its expensive and highly vulnerable Air and Navy components.

Tenacious adherence to a single strategic concept characterized all of General MacArthur's operations, throughout this widespread theater some 3,100 statute miles from Batavia to Kavieng,—equivalent to a front encompassing the Northern Hemisphere, from the Panama Canal to Hudson Bay, Canada, including the full length of the United States from Miami to Buffalo. An arrow of advance runs straight into the Philippines.

The military operations in the Southwest Pacific Theater can only properly be appreciated against a background of geographical distances. If we superimpose the area of Continental United States over the Southwest Pacific Theater, Bougainville is in the approximate location of New York; Milne Bay is very near Charleston, Darwin is north of El Paso and conquered Hollandia is beyond Milwaukee. Seattle corresponds to the center of Borneo and San Francisco lies in the east end of Java, while Denver and Salt Lake City are in the vicinity of Portuguese Timor. Based on Milne Bay and Moresby, aerial strikes were executed that reached as far as Boston in the north, St. Louis and Chicago in the west. Based on Darwin, targets were attacked at equivalent distances to Denver, Salt Lake City, and San Francisco.

The local tactical and strategical problems would be comparable to those set at a hypothetical American Headquarters, stationed at Miami, charged with the mission of conducting an advance by land, sea, and air that stretches from Charleston to the Canadian border. When the Americans took Sansapor, they made an advance from Charleston to Billings, Montana. When they reached the Philippines they had covered a distance to Edmonton, Alberta, Canada.

This is war in space! This enormous extent of military geographical area was actively covered by an Air Force and a number of Infantry Divisions that are insignificant, compared to the huge masses poured into Western Europe.

Were we to superimpose the SWPA [Southwest Pacific Area] over the European Theater, we would find that the Mediterranean barely covers the northern half of Australia; that our operations from Finschhafen to the Vogelkop are equivalent to the distance between Batum, on the Black Sea, to Berlin, and that an advance into the Philippines, in a straight line from Milne Bay to Manila, carries from the Black Sea, via Odessa, Konigsberg through Norway to Iceland.

This is war in space! These enormous distances were conquered, a master axis of advance was determined within the framework of a master plan and against climate, terrain and an anachronistic suicidal foe. Operations stretching over 2,500 miles were relentlessly pursued throughout the bitter years of 1942-43 and 1944 until the brilliant

goal was within inescapable reach in 1945.

The attempt of General MacArthur to create a modern Army of ten to twenty divisions in the Philippines with an annual budget of ten million dollars is an epic in itself. He almost suceeded. The Japanese General Staff paid him the sinister compliment not to wait until his ten year mobilization program was completed and struck in its fifth year. The salient features of the Philippine Campaign, terminating at Bataan and Corregidor are generally known; its quality of greatness is probably less widely understood.

The Japanese capacity, probable action and plan of invasion were brilliantly anticipated by a strange and discerning genius, Homer Lea, in his monumental work, "The Valor of Ignorance," published in 1911. This extraordinary work created a sensation in the General Staffs of the world. The American Chief of Staff found it important enough to write a preface. The growing Japanese menace was probably understood by the principal chancelleries of the world, except America.

The structure of the militarization of the Philippines is the skeleton on which the resistance movement was pegged; it is also closely linked with the campaign in 1941-42. There are any number of interesting, professional points. In a war of logistics, another name for men and supplies, MacArthur seems to have been pursued by devils of chicanery. The war began long before 7 December 1941. The War Department, however, let the Philippine plant run down in the last decade of 1940; no appropriations, no new construction, just enough to keep the plan from falling apart. Philippine Independence explained all that. The exalted war plans, which the Staffs of all nations putter around with, either have teeth in them or not. The Jap War Plan for 1941 had teeth in it. Our plan did not, but provided only for the defense of the entry into Manila Bay, to be held for several months for the rescue fleet that never came. We ran out of food, primarily: when you plan on six month's supply for 90,000 men and add 30,000 refugees, then your waiting period skrinks to four months instead of six.

The Filipinos fought well and devotedly; the Regulars, known as Philippine Scouts were second to none, but a veteran Army cannot be erected on six months' ROTC training; MacArthur lost in a race against time, training, equipment, and supply.

A good General is a craftsman, able to gauge accurately the capacity of his tool. The story of the first Philippine Campaign is probably known; it contains some of the nicest split-second maneuvers in the history of warfare.

The Jap landed at widely dispersed points; that did not fool anybody; his main landings, in Lingayen Gulf and Lamon Bay were to drive the Philippine Divisions into Manila. The Jap was well-informed; strength, location, and routes of our main groupings were accurately plotted on the intelligence maps of the Japanese Headquarters.

Bataan's forests and ravines gave General MacArthur his only chance. He promptly called in his divisions in the south. On commercial busses, large columns poured through Manila, northward across a single bridge, the Calumpit defile. A great occasion. The Jap knew it and wildly strove to cut this vulnerable point. MacArthur threw in his tanks and held sufficiently long to clear the bridge.

The hazardous timing of this operation is remarkable; it is a school problem for Staffs. One slip, and the divisions would have been cut-off, cornered within Manila, ultimately destroyed, the total defense force cut in half. It worked, the assembly on Bataan enabled reorganization and a brilliant systematic defense. No trained veteran divisions could have done any better.

The heroic defense of Corregidor and Bataan is history. In a world in defeat, the only light of hope flickered in the forests of the Bataan Peninsula.

Transferred from this hopeless cause to organize a counteroffensive, General MacArthur left for Australia, by Presidential Order.

The tactical and strategical problem then was the protection of the Australian mainland against further Japanese incursion and to prevent the interruption of U.S. shipping

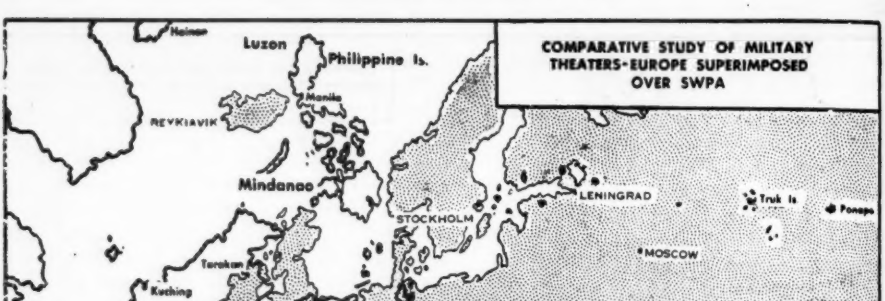
routes through the South Pacific. The Japanese expected to accomplish both by a southeasterly advance through New Guinea, Papua and the Louisiades and a parallel advance along the chain of the Solomons.

Shortly upon the arrival from the Philippines, General MacArthur made his first great decision, namely to defend the Australian mainland by a fight to the finish in the New Guinea area. He promptly displaced his headquarters forward about 1,500 miles and thereafter the forward movement of troops and establishments followed this great decisions.

On the enormous front of the Southwest Pacific Area, approximately 3,000 miles, extending from Soerabaya to Bougainville, separate operations were conducted that were, in fact, consecutive elements of a single, strategic conception; the continuous calculated application of air power employed in the most intimate tactical and logistical union with ground troops, the application of offensive power in swift, massive strokes rather than the dilatory island-to-island advance that some strategists predicted in the Pacific, where the enemy's strongholds were dispersed throughout a vast expanse of archipelagoes.

The far-flung operations of this extensive front were firmly held together by the central theme of a general plan: the liberation of the Philippines. As the basis of military action, we note the most subtle employment of the factor of surprise. With relatively little loss of life and the minimum of assault forces in ground action, the enemy was defeated or neutralized. Enemy strongholds were almost invariably by-passed and their supply lines severed, first by air, then by small naval craft. The envelopment as a maneuver form, and the decisive operation against flank and rear of the enemy were employed in preference to frontal attacks, the economic futility of which has always been known to be a very expensive and bloody undertaking.

One of the greatest military technicians of all times, Napoleon I, operated against flank and rear of his opponent almost habitually. He employed this form of attack from thirty to forty times, over a period of years. It was with great reluctance that he undertook frontal assaults.



MacArthur applied to these classical precepts the most modern technical means. He understood, in particular, the enormous flexibility of air mass. His method was more and more revealed as he calculated the advance of his bomber-lines, by the seizure of advanced bases, so that his relatively small force of bombers could continue its attacks under cover of his limited fighter force, operating on short and medium ranges. Each phase of advance had the objective of airfields, which determined the scope of distance of the next advance.

As this airline went forward, our naval forces, under newly established air coverage, regained the sea-lanes, which up to now had been the undisrupted principal arteries of the enemy's dispositions. The masterly coordination of ground, sea, and air have not had a more brilliant exhibition in recent times. The operation from New Guinea to Luzon is a military model of first rank—a Chancellorsville of Continents.

Along the iron axis: Papua—Luzon, he executed a series of brilliant amphibious maneuvers. Ground, Air, and Navy components were welded into a perfectly integrated machine. The high points of successive conquests were: Gloucester, December 1943; the Admiralties, February 1944; Hollandia, April 1944; (the destruction of the Japanese XVIII Corps in this general area); Biak, May 1944; Noemfoor-Sansapor, July 1944 and Morotai September 1944—the springboard to Leyte! These successive operations netted the destruction or emasculation of eleven Japanese divisions and brigades, an impressive string ranging from Bougainville to Morotai, that is, the 6th, 17th, 20th, 32d, 35th, 36th, 38th, 40th, 41st, 51st, and 65th. With auxiliary troops, they represent an equivalent of 300/400,000 casualties, whose pathetic remnants were long ago stricken from the books of the Japanese General Staff.

In the pattern of general Pacific war, however, the brunt of fighting was centered from 1942-44 in the Southwest Pacific Area. There is no area of the Japanese conquest, from Burma to Manchuria that was exacting a similar toll. A major proportion of the Japanese Empire's total resources in planes and ships were poured into this front. In myopic fanaticism, the Japanese continued to pour reinforcements into the fight and

kept pace with their terrific losses, easily comparable to the most intense operations in western Europe.

The defeat of the enemy in the air was equally decisive. In constant attacks on his main air bastion, in the Solomons and New Guinea, the Jap lost over 3,000 planes on the ground and in the air; at Hollandia alone 475 separate wrecks were definitely identified; in comparison with such tremendous air-blows, the affair of Clark Field in 1941 and its fifteen bombers had shrunk to insignificant proportion.

The combination of Air and Navy was equally deadly: from the Spring of 1942 to 1944, Air and Navy destroyed 375 warships, 2,475 barges and 973,000 tons of merchant vessels.

Against this stupendous achievement, there is an astonishing record of economy in men and in material. War is a form of bookkeeping; in payments that are final with a white cross as signature. The grand total of American casualties, in the Southwest Pacific Area, to include 1944, was 2,479 officers, 16,278 men, killed, missing, and wounded, ranging from slight to serious; most of the wounded returned. A trial balance in the important campaign of Aitape is characteristic. The ratio in killed is roughly one to thirty in favor of the Americans; the tally: Americans killed—285, Japanese killed—8,065. In the Philippine Campaign, the ratio is probably lower and fluctuates from one to twenty-eight in the Visayas-Mindanao to one to twenty-two in Luzon.

The great Campaign of Liberation entered its final phase. The baffled enemy was not permitted a breathing spell. Within three months, from the springboard of Morotai, a major amphibious assault was launched of preliminary preparation and initial strength comparable to the Allied invasion of Normandy.

Anticipating an attack on Mindanao, the Japanese were decisively surprised and the Tacloban beachheads were secured with small casualties. The U.S. Sixth Army, operating under broad strategic conceptions of piercing the enemy colonial conquest in the center, thereupon broke through his vulnerable Visayan front and commenced rolling up the flanks to north and south. Although a Japanese naval reaction to this obviously vital encroachment was immediate and strong, its fate in Surigao Strait, Leyte Gulf and off San Bernardino Strait is history; the combined Third and Seventh U.S. Fleets, dealt it losses of major warships so great that the Imperial Navy was irretrievably crippled. On 26 October General MacArthur stated: "The Japanese Navy has received its most crushing defeat of the war. Its future efforts can only be on a dwindling scale." This abortive Naval sortie did not disrupt our ground advance. Within ten days after the landing, the liberation of a million and a half Filipino people on the islands of Leyte and Samar was virtually accomplished. On that first free Sunday, all churches were opened throughout the liberated areas and divine service was attended by the free population.

In a desperate effort to retrieve the strategical position lost in eastern Leyte during October, threatening his hold on the entire Philippines, the enemy started a chain of reinforcement convoys into Ormoc Bay. Troops and mechanized equipment from Manchuria, China, Luzon, Mindanao, and the Visayas were hurriedly dispatched toward the Western Leyte battleground in a constant vulnerable stream. Despite initial losses exceeding 35,000 men, the infamous Yamashita began an unparalleled squandering of troops to protect an obviously hopeless situation; within one month he more than replaced these initial losses, and ultimately committed an entire corps. By 30 November, at least six troop-laden convoys ran our sea and air gauntlet toward Leyte and disaster; of these attempted reinforcements 21,000 men were lost at sea; twenty-six vessels, totalling 92,750 tons and seventeen escort warships were destroyed. By late November, Japanese dead on Leyte had exceeded 45,000 as compared to our losses of 1,133 killed and 4,432 wounded, this great disparity being due to our tactics of mobile maneuver and superior

artillery which steadily reduced the enemy without possibility of effective retaliation. At the end of the Campaign, Japanese dead and captured on Leyte exceeded 82,000, exclusive of losses at sea, a mute and grisly monument to dreams of empire that in its brute savagery turned back the clock of centuries.

Meanwhile, Philippine guerrilla forces in the western Visayas and Mindanao had maintained an aggressive offensive against enemy garrisons on the several major islands and had succeeded in liberating large areas, including strongly-held coastal points and airfields. Constant guerrilla pressure seriously disrupted enemy communication lines, impeded free movement of his reserves, and constantly bled him through troop and supply losses. Colonel Fertig in Mindanao, Colonel Peralta on Panay, Lieutenant Colonel Abcede on Negros, Lieutenant Colonel Cushing on Cebu, Lieutenant Colonel Suarez in the Sulu Archipelago, Inginiero on Bohol and Kangleon on Leyte, led their gallant men in constant disruption of the enemy's rear areas. Our later amphibious assaults against the inner Visayas, Mindanao, and the Sulus were hastened to decisive success by this invaluable aid. The stage was set for the final act of liberation.

In personal command of assault operations, in an epochal envelopment of the enemy's rear, General MacArthur sent an irresistible force ashore at Lingayen Gulf on 9 January 1945, that in twenty-six days swept Luzon's Central Plain and entered Manila. Simultaneously, our airborne and parachute troops previously landed in Batangas, raced into the city from the south to complete the enemy's local envelopment. Flouting the humane precedent set by MacArthur in 1941, the Japanese organized a bitter defense of Manila. More than 20,000 naval troops turned the city into a complete fortress. Our unexpectedly rapid advance and envelopment dislocated this supreme barbarism, to some extent, and spared much of a city otherwise marked for utter destruction by its suicidal defenders. The atrocities which could not be prevented in time, have echoed in horror throughout the world wherever men are free.

The Philippine Islands are now liberated. This arduous island campaign of eight months, beginning at Leyte Gulf, ended with the current final phase of mopping up in Mindanao and Northern Luzon. A democratic nation has regained its freedom from the invader.

Japanese military forces in the Philippines, reinforced after our initial landings on Leyte on 20 October 1944 comprised an entire Area Army, two Army Corps, at least twenty-two divisions and brigades, and a large number of service troops totalling 400/450,000 men. Merchant marine, laborers and hastily drafted civilians swelled this locust plague of armed occupational forces. Our forces comprised seventeen divisions. This was one of the rare instances when in a long campaign a ground force superior in numbers was entirely destroyed by a numerically inferior opponent.

Naval and air forces shared equally with the ground troops in accomplishing the success of the campaign. Naval battles reduced the Japanese Navy to practical impotence and the air losses, running into many thousands, seriously crippled his air potential. Working in complete unison the three services inflicted the greatest disaster ever sustained by Japanese arms. Enemy losses in the Philippines exceed 380,000, a mortal wound inflicted on the Japanese Army with relatively low losses to ourselves, yet another example of the brilliant quality of economy of force.

The strategic effect of Philippine liberation set the stage for ultimate Japanese defeat at home and in the south since these areas were isolated and severed from each other. The Japanese Empire and its cardhouse "Greater East Asia Co-Prosperity Sphere" was doomed.

Joint Logistics at an Advanced Base in the Pacific

COLONEL HARLAN D. BYNELL, *General Staff Corps*
Senior Army Officer, Joint Staff, Commander Marianas

NOW that hostilities have ceased, more and more attention is being focused upon a reorganization of our National Defense system so as to make it more effective in the efficient preparation for war during the time of peace. This is a direct result of the great strides toward bringing the services closer together that have been achieved during the progress of the war. As a result, many of our high-ranking officers favor a reorganization into a single department.

Without trying to sell the reader on the advantages of a single service, the purpose of this article is to direct attention to the fact that joint logistics has been an actuality in the Pacific. Here, joint logistics was not only essential to the support of operations—it is an established fact that this concept worked remarkably well.

During the evolution from separate logistic support of each service to a system of joint logistics, numerous difficulties were encountered. Inconsistencies and lack of understanding often hampered complete integration. Many of these handicaps were overcome by the stature of our leaders.

Command

The advanced base area under discussion is the area known as that of Commander Marianas under Vice Admiral G. D. Murray, USN. It was activated originally as Commander Forward Area, Central Pacific, by Vice Admiral John H. Hoover, USN. Although the area involved more than the name would imply, the Marianas Islands, for our discussion we will consider only Guam, Tinian and Saipan.

Each island was commanded by an Island Commander who was directly responsible to Commander Marianas. In turn, each island commander commanded in his garrison all forces; Army, Navy, and Marine (land, sea, and air) assigned for local defense, construction work, or other garrison duty. The command of other forces assigned to the area was exercised through normal force, group, or unit commanders. Of the three islands mentioned, one was commanded by a Navy Rear Admiral, one by a Marine Major General, and the third by an Army Brigadier General of the Air Force. Yet each island contained units of all services within its perimeter. Of the total military population on these islands, 44% was Army, 32% Navy, and 24% Marines.

From the above paragraph, it is evident that *not all units* in the area were in the chain of command of Commander Marianas or the Island Commanders. For example, units of the Strategic Air Force were directly under command of the Joint Chiefs of Staff in Washington, yet Commander Marianas was charged with the responsibility of furnishing certain logistic support to this mammoth Air Force. On the other hand, a large Army Base Section in the area was responsible for certain logistic support to all services in the area and other logistic support to strictly army units in the area, yet this organization was not in the command chain of Commander Marianas.

Thus it can be seen that Commander Marianas had to utilize both of the methods of coordination envisioned in Chaper II of "Joint Action of the Army and the Navy," that is, by mutual cooperation, and by the exercise of unified command.

Mission

Before considering the method Commander Marianas employed to control this conglomeration, an analysis of the mission of this command in the middle of the Pacific that was so vital to our line of communication from the mainland is in order. First, it was designed as a fleet base to support our forces afloat, with demands not only on maintenance stores but also on the tremendous harbor facilities, dry docks, and major repair units required to maintain the Navy afloat. Second, it provided bases for our VLR [Very Long

Range] bombers which included not only the maintenance shops to keep them flying but also the supplies to satisfy their tremendous appetite for gulping millions of gallons of gasoline and their prodigious capacity for ferrying thousands of tons of bombs. Then too, these islands were a rehabilitation and staging area for ground, sea, and air forces of all services.

One of the most important of the many missions assigned was that of a reception and staging area for the many casualties evacuated from battle zones by all services. This command also provided major supply bases for all types of supply for all arms of all services in support of air, sea, and land operations against the enemy. It can readily be seen that thousands of men, as members of hundreds of service units, were required not only to construct the bases within this command but also to keep them in operation as well.

When these islands were liberated or invaded they offered little in the way of resources; total assets consisted of a few palm trees, a few natives, and narrow winding dirt roads that in most places were impassable to even the reliable jeep. Ground had to be cleared and all facilities and installations had to be constructed by our joint forces since roads, tank farms, wells, buildings for headquarters, hospitals, and supplies were nonexistent. How different from other areas of conquest, such as Africa, Italy, and France, which did contribute some buildings and roads for use by the military.

Here is a partial list of some of the major facilities required on one island of this command to perform this complex mission:

Army Base Command (Depots of all arms).
Naval Air Bases (2).
Army, Marine Airfields (3).
Naval Operating Base, including harbor facilities, breakwater, dry docks, dredging, anchorage facilities, ships repair and overhaul facilities.
Naval Supply Depot, including:
Advance Base Construction Depot.
Automotive Construction Equipment Parts Depot.
Ordnance Annex.
Naval Aviation Supply Depot.
Army Air Depot.
Marine Field Depot.
Fleet Hospitals (3).
Army Station and General Hospitals (4).
Army Ammunition Depot.
Naval Ammunition Depots.
VLR Ammunition Storage.
Fuel Tank Farms.
Reefer Storage.
Naval Air Transport Service.
Air Transport Command.

All of these were large installations requiring millions of square feet of open storage and thousands of square feet of covered storage. One of these installations alone required 450 buildings 40 x 100 feet in size and had an inventory of 400,000 tons valued at 430 million dollars.

Staff

The fact that these units and facilities represented all of the armed forces of our country necessitated Commander Marianas being reinforced with technical specialists of all of the services; he was therefore supported by a joint staff composed of officers and enlisted men of the Army, Navy, and Marine Corps. As we are discussing only the logistic aspects, we will confine our view to the logistics sections of the staff. In doing so, let us not lose sight of the fact that this commander had additional responsibilities such as that of defense of the bases, operations against the enemy, convoy and routing of all shipping to and through the area, aircraft search and reconnaissance, an air-sea rescue service, and other duties to perform that were handled by other sections of the staff. So complicated and varied were these matters that his staff included eleven sections that could be classified as general staff sections as well as eight additional sections that could be classified as special staff sections.

The logistic operations of the command

were not all under the cognizance of one General Staff Officer, as the G-4 in the organization of the ordinary Army command. Actually, there were five separate and distinct staff sections each responsible for some phase of logistics, each a General Staff section in its own right, and each directly responsible to the Admiral through the Chief of Staff. These sections are shown in Figure 1.

As this narrative continues it will be noted that many different methods for insuring the steady flow of adequate supply were in use. Some items arrived in the area on an automatic basis. Other supplies were requisitioned by using agencies. For some types of supply it was necessary for this headquarters to anticipate demands, and in many instances this data was siphoned from the mass of nebulous plans that a higher headquarters or a particular service were conceiving. Our entire mission was revised several times and each time the result required greater tonnage, until finally the tonnage required was twelve times the amount originally planned.

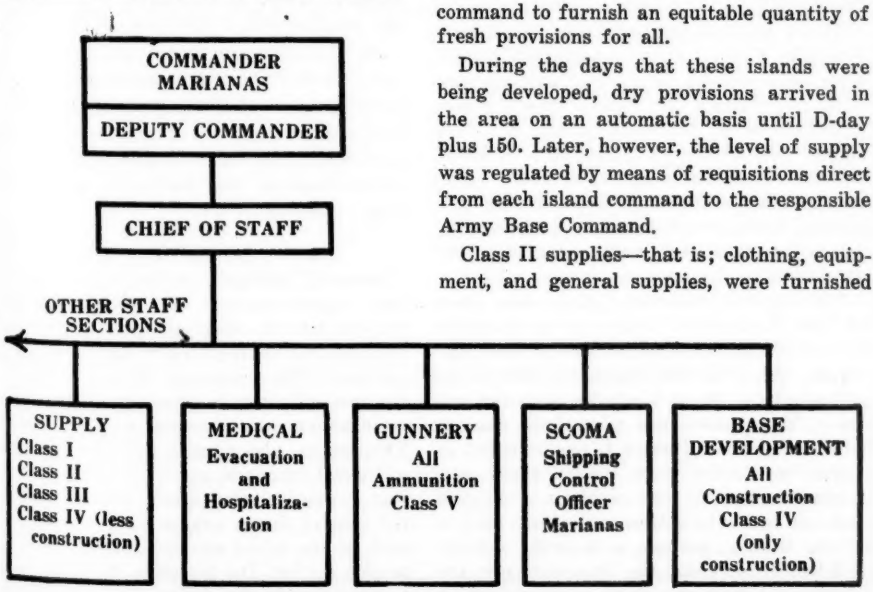


Figure 1.

Supply Section

Let us first consider the Supply Section. It was responsible for Classes I, II, III, and IV—less construction materials.

The supply of Class I reveals the first evidence of joint logistics. Dry rations, for all of the forces ashore, land, sea, or air, were furnished by the Army Base Command, an agency not under Commander Marianas. The Army Base Commander had been authorized to deal directly with each Island Command, although this was not the normal chain of command; so this logistic support was furnished by mutual cooperation, and it worked very well.

Fresh provisions, on the other hand, were furnished to all forces ashore, land, sea, or air, and to the forces afloat by a Naval agency, Service Force, Pacific Fleet, under the system of unified command. Certain reefer ships were designated as Marianas pool ships and as such were under the direct control of Commander Marianas. These ships were shuttled between the various islands of the command to furnish an equitable quantity of fresh provisions for all.

During the days that these islands were being developed, dry provisions arrived in the area on an automatic basis until D-day plus 150. Later, however, the level of supply was regulated by means of requisitions direct from each island command to the responsible Army Base Command.

Class II supplies—that is; clothing, equipment, and general supplies, were furnished

on requisition direct to type commanders. Class IV; medical, motor maintenance, post exchange, ship's store, and aviation supplies were provided in the same manner. When required, Commander Marianas arranged for the exchange of common items of these two classes between the various services.

The control of Class III products was a true joint project, as these products were furnished by the Navy for the entire population ashore, Army, Navy, and Marine Corps, and for the units of the Fleet that were based in these islands. The method of requisition was as follows: The Supply Section on the first of each month prepared a bulk slate showing estimated requirements for four months forward. These slates were based on a knowledge of Fleet requirements as obtained from operation plans insofar as delivery to the forces afloat was concerned, and on reports for the Air Forces as to the estimated number of operational planes it would have at land bases during the period in question insofar as aviation gasoline was concerned.

Motor gasoline estimates were based upon available figures as to populations ashore. Lubricants were a function of aviation gasoline consumption or of motor gasoline consumption or of the consumption of Navy special fuel oil for the Fleet. In addition to these normal requirements, certain special requirements occurred with increasing frequency. These included mounting out requirements for units that were going on future operations.

The proper distribution of the greater share of Class III products in the area was exercised by the control of tankers. This section also recommended the installation of tank forms and pipe lines. Many headaches occurred and one of the greatest can be realized when it is revealed that Class III requirements of Avgas on VJ-day were twenty times that originally planned. New problems arose each day, and had to be solved on the spot. On one of the islands, because a dormant volcano still had active roots, the temperature in the ground was high enough to cause vapor-lock in the oil lines.

During the period when the B-29's were concentrating their tremendous might on Japan, our Avgas requirements amounted to slightly over two million gallons per day.

Medical Section

The Medical Section was responsible for making history in the evacuation of casualties from active operation areas to the Marianas. One-half of all casualties evacuated from Okinawa traveled by air. This meant that the period from the time a man was wounded in the front lines until he was in an Army or Navy hospital, 1250 miles away, was in many cases a matter of only ten hours. These casualties traveled in either Army or Navy planes, or in either Army or Navy hospital ships irrespective of the patient's service. A wounded soldier or sailor was placed aboard the first available type of transportation consistent with the care required and without regard to placing him on the transportation of his own service. On arrival in the Marianas he was, in the same manner, placed in a hospital of either service, irrespective of his own service.

As operations continued and the area became more stabilized, it became possible to bring Army casualties in on Army transportation to Army hospitals. The same system also prevailed in the Navy. At times total patients hospitalized in the Marianas reached the total of 12,000.

Gunnery

Gunnery did not, as one might suspect, have cognizance over all ordnance material, but confined its responsibilities to providing all ammunition required in the area by all services. The Gunnery Section also was charged with storage of ammunition and with maintaining an adequate level of supply. This section also applied both the principles of unified command and mutual coordination. For example, requisitions for ammunition for ground forces ashore were prepared by each of the island commands and passed on to this section. On the other hand, ammunition required by the air forces was anticipated by the Gunnery Section without requisition

from them. Because of the rapid advance in the development of aerial bombs the time between order and delivery had to be reduced, and this automatic supply was one method of accomplishing it. Then there was additional ground ammunition required for units staging in the Marianas, and this too had to be anticipated by the Gunnery Section.

So much for the requisitioning process. The actual supply of ammunition by the various supply agencies was also a joint project. All aviation ammunition common to all services was furnished by the Navy. All ground ammunition common to all services was furnished by the Army. All special types of ammunition were furnished by the type commands.

The receipt of a requisition for ground ammunition from an island command did not mean necessarily that the paper would be passed on to the supplier. If the supply could be furnished from one of the other island stocks, it was so done.

SCOMA

The Shipping Control Officer Marianas was identified by the short title SCOMA. This staff section had charge of and regulated all maintenance shipping to the area, in the area, and from the area.

Involved were the ships of many different agencies, including even a separate navy for the Army Air Forces. This Air Force navy was composed of ships that contained equipment and crews for aircraft maintenance. Movement of these ships was controlled by SCOMA. The actual routing and dispatch of all ships, irrespective of whose they might be, was expeditiously handled directly from SCOMA through the port director at each island.

To discharge its functions properly, it was necessary for SCOMA to track and keep a continuous record of the location of every non-combatant vessel in the Pacific. This was accomplished by a large map board of the Pacific on which miniature ships actually occupied the positions on the map that their namesakes occupied on the blue waters of the Pacific. This information was essential so that communications could be directed via radio to each vessel in the case of a diversion or other emergency.

To discharge the thousands of tons of supplies required per month in the area without needlessly allowing ships to swing in the stream and remain idle in port was also a responsibility of SCOMA. SCOMA did not have command over the ports and service units involved, but SCOMA did exercise the necessary supervision through the island commanders.

The following example reveals some of the joint effort under SCOMA's care. A cargo of material was furnished by the Army on one island, loaded by the Marines, transported on craft of the Amphibious Force Pacific, unloaded at another island by a Navy Special Construction Battalion, and delivered to the Air Forces.

Base Development

The Base Development Section of Commander Marianas was charged with all construction in the area. Early in the planning stage, the plans for construction for each of the services was coordinated by this section with each island command. Here priorities were determined, materials were provided, and the construction troops assigned. Navy Construction Battalions frequently built Army air fields and Army Engineers built Navy hospitals.

After each project required by either of the services was approved by this section, the actual requisition for the material required was passed on to the type supplier. However, when the material arrived in the area, the entire ship load frequently was diverted to an island other than that for which it was originally intended. When it arrived in port and was unloaded, it did not go into an Army or Navy stock pile but into a joint pool under the Island Commander's control; it was released by him according to the approved priority already established.

It is difficult for one to realize the magnitude of the building program in those islands without actually seeing it. The number of tons of materials required added

up to a total that would make even a financier gasp. From the day construction began until the end of August 1945, over five and one quarter million man-days were expended in construction alone by hard-working and enthusiastic white and colored GI's of the Army and Navy. This progress was a testimonial to American genius, ingenuity, and equipment.

There have been many problems that had to be solved in the field. Earlier in this article mention was made of the heat of the ground causing vapor-lock in oil lines. This same heat caused fresh water delivered from the bowels of the earth to soar to a temperature of 180 degrees Fahrenheit. Ordinary pumps with ordinary packing soon broke down under this unusual circumstance. After much improvisation the problem was solved and the required amount of fresh water was supplied daily.

Conclusion

Our land, sea, and air forces dealt terrific blows against the enemy from this solid Marianas Base. Of the maximum effort expended, over 80% of it could be measured in terms of logistic support. Because the war has compelled it, logistic agencies of the various services learned to understand each other and work together as a team.

The elimination of dual handling systems, the consolidation of supplies, the consequent saving in warehouse space, and the availability of certain facilities of each service to all services resulted in a saving in manpower, time, and cost which represented no small contribution to the war effort.

The entire system worked remarkably well. The proof of the pudding was in the eating—with the Japs eating the proof. The success of the joint support represented thorough planning, a continuous follow-up to insure the successful operation of the plan, and the urge on the part of the members of the staff to give all services an equal break. Great strides in joint logistics were made, and it is hoped that a few pages from the Journal of Commander Marianas will be utilized as practical data for future *Joint Action*—whether it be by "MUTUAL COOPERATION" or "UNIFIED COMMAND," whichever course is to be pursued.

It is the commander who shares, naturally and unpretentiously, in every problem of the group, whether in bivouac or on the battlefield; who gains the confidence of his men and gives to them his own; who shares with them every vicissitude of fortune; who takes no thought of himself until every need of all of his men has been accommodated; who learns from them as much as he can teach them, and who expresses in every word and deed his pride of belonging to the whole who invariably gains for himself the greatest reward that can come to any man.

This reward is the respect, esteem, and love of his associates. Moreover, his is an elite unit. Such a man is a stranger to resentment from his men. They accord—they demand for him—a position before the world that comes only to those who have rendered honest service to their fellows.

General of the Army Dwight D. Eisenhower

A great part of our losses during the first part of this war was the penalty for our failure to heed, during the intervals between wars, the lessons so hardly learned during war.

Fleet Admiral Ernest J. King

Development of Radar and Control in Air Operations

COLONEL REX J. ELMORE, *Air Corps*
Instructor, Command and Staff College

ONE of the outstanding contributions of the allied powers was the development of radar and control in air operations. This weapon and technique was developed since the start of the war and was still reaching new stages of perfection in design and technique at the conclusion of the war. It is believed that those who had no occasion to be intimately connected with this phase of the conduct of the war will be interested in a brief description of the part it played.

Initial Phase of Radar Application

Radar in its initial conception was strictly a defensive weapon. The theory of radar operation was developed into a practical device through the combined efforts of the British and Americans. As its name implies RA (radio) D (detecting) A (and) R (ranging) it was not in those early stages considered an offensive weapon; however, as will be shown later this infant equipment was to become a giant of enormous offensive capability.

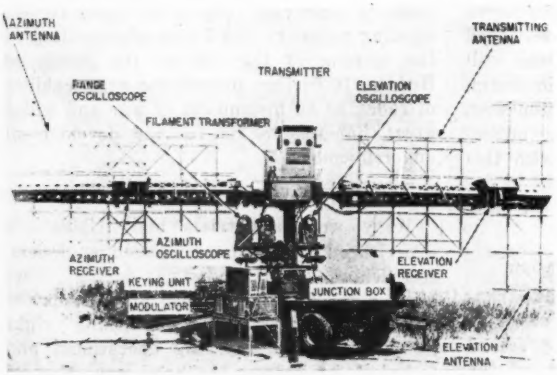
In the spring of 1940 the Germans were having everything their own way, spreading their crushing tentacles over all the countries of western Europe from Norway to southern France. They had air power and air superiority and were drunk with offensive spirit. Presumably they gave no thought to a defensive instrument such as radar.

The German air power and air superiority over the British was a terrific advantage. By this time, however, the British did have some radar controlled searchlights and anti-aircraft artillery. The value of this countermeasure may be realized by the fact that in the summer of 1941 the British had installed a chain of radar controlled searchlights along the coast line. At the outset of aerial blitzkrieg which the Germans launched in the Battle of Britain these searchlights would spot instantaneously the enemy flights of Junker 88's and Messerschmitts and make it possible for a comparative handful of British airborne fighters to pounce on and destroy extremely large numbers of enemy bombers time and time again. This terrific mauling taken by the Luftwaffe resulted in the turning of the tide of the Battle of Britain. It further proved the practicability of radar as an instrument of war and added great impetus to its further development and refinement.

Development of Early Radar

Many were the trials and tribulations experienced by the hard pressed engineers, technicians, and producers during those early days. Time being such an element the necessity for having just "something" right away resulted in learning operational and technical weaknesses the hard way; that of trial and failure. But sure and steady progress was made and at the time of the United States entry into the war in December 1941 some radar defense had been established in Continental United States and some of its possessions. These consisted mainly of obsolete SCR 268 searchlight control sets, sited to attempt to utilize it for early warning and also the original version of the SCR 270 early warning set. The coverage provided was inadequate for two reasons. One was a misconception at first of the technical qualifications of a good radar site. This conception was that generally the more altitude the radar was set on, the greater the coverage. This proved false and practically all the radars had to be relocated on new sites. The other reason for the weakness of the system and one difficulty faced by the entire program of radar development, was the lack of trained operating personnel and technicians immediately available. An extensive and intensive training program was under way both in the United States and the United Kingdom but initially the quantity and quality of personnel could not be produced fast enough. Another difficulty encountered was the maintenance and constant modifications to the design of the

sets. Spare parts could not keep up with modifications and set production which resulted in a great deal of cannibalism and consequent inoperative equipment.



Radar Equipment—SCR-268 (Signal Corps Photo).

As a result of the problems developed every day and the successful effort exerted to whip them, various other types of equipment were produced to cope with different operating situations. It was soon realized that the inherent bulkiness and weight of radar equipment plus its necessary auxiliaries would decidedly influence the application and flexibility of equipment in combat. Great effort was made to increase mobility, reduce weight, but at the same time increase the accuracy and fidelity.

As the months rolled by new equipment and new operating technique made its appearance and as the war progressed more and more thought was given to the offensive use of radar. It is believed that the first tactical use of this offensive principle of operation was by the Royal Air Force in the Middle East Campaign originating in the defense of and jump off from the El Alamein line in Egypt. The system used was one consisting of one or more (depending on the front line area to be covered) forward control units each consisting of a COL (type 6) radar, a COL type early warning radar and necessary operations vehicles, power units and ground observer units. These forward units were tied into a rear control unit which resulted in an extension of the control area from 100 or more miles behind the British front line to seventy or eighty miles behind the enemy front line. This made it possible to effect interception of Stuka raids well before the enemy reached the front line. Interceptions were controlled and made from radar plots by a ground controller and visual contact by the pilot with the enemy flight. Though a rough method, it was effective and GCI (Ground Control Interception) as it is known today was not used in this early operation. GCI was in limited use in the Middle East but primarily in the defense sectors of the Delta area.

Integration of Control with Radar

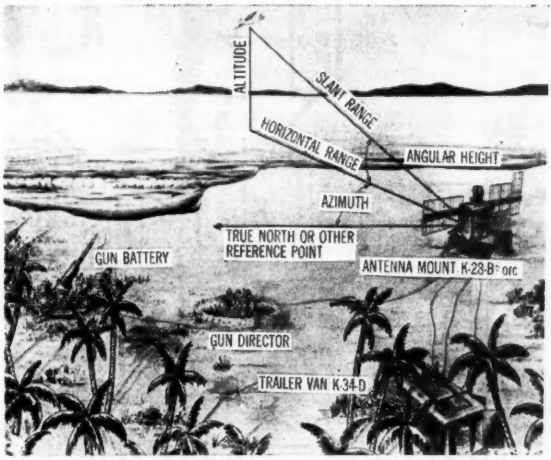
From this rather inauspicious beginning and with the successful development of the African Campaign a greater opportunity presented itself for the application of more precise and mobile type of equipment as well as expansion of ground control of aircraft. Air cooperation in support of ground units received its baptism in the sands of Egypt and Lybia. Its successful inception led to an impressive development to its present elaborate, efficient and effective state. In rapid progression came the use of Tactical Control Groups with Tactical Air Forces, mobile light weight warning units, higher precision early warning, and ground controlled interception units, airborne radar and navigational aids for both tactical and strategic aircraft and numerous wire and radio items for the refinement and expansion of control. It was soon learned, early in offensive operations that the most effective and economical use of aircraft could only be achieved by providing the tactical pilot with every possible aid of all types from the ground to allow him freedom of mind and body to con-

centrate on his assigned mission. Furthermore economy of aircraft could only be effected by centralized control which results in the proper number of aircraft, at the proper place at the proper time.

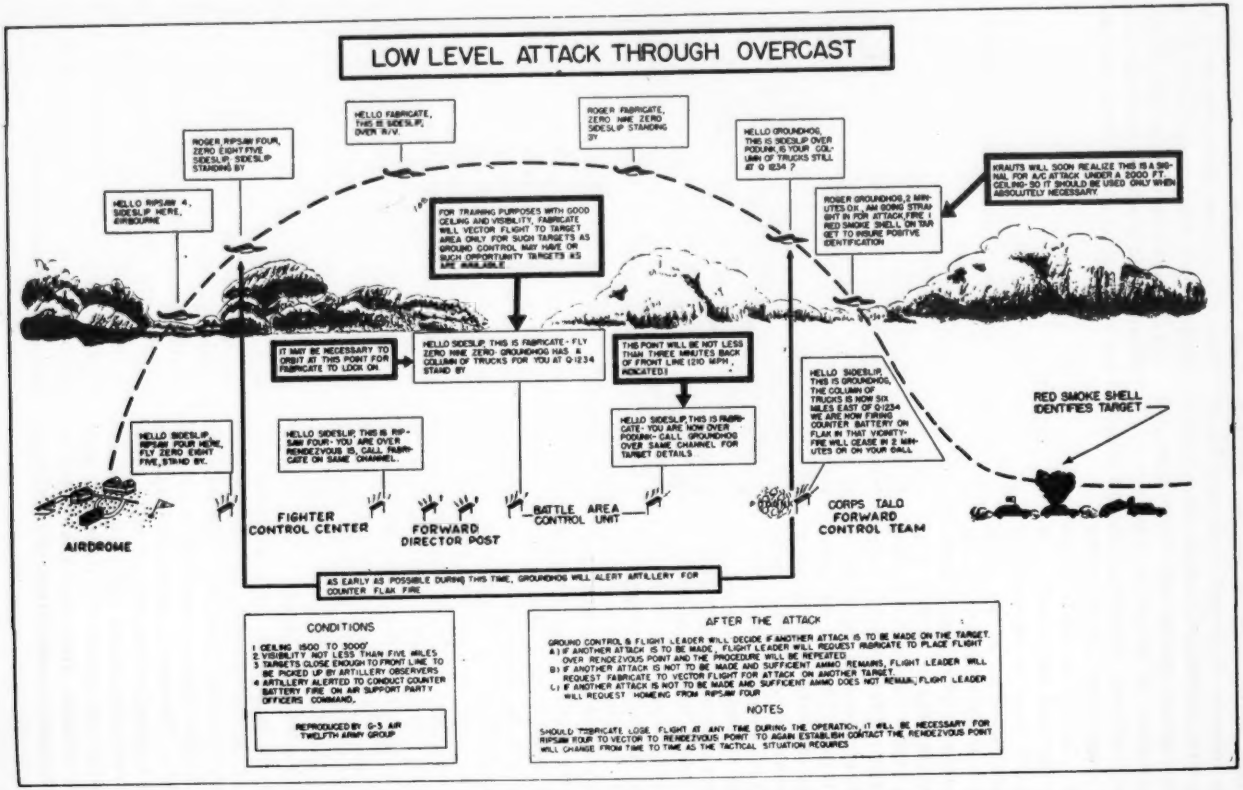
The technique and integration of control and radar have made enormous strides. It is a far cry from the small forward and rear control units set up in bread vans and under tarpaulins in the sands of the western desert to the elaborate prefabricated or semi-permanent fighter control centers, combat operations rooms, forward director posts and battle area control units. So is it a far cry from the vectoring of an intercept mission on a radar plotting board in an operation van in the Western Desert to the elaborate pin point accurate vectoring direct from the PPI (Plan Position Indicator) of a long-range set or the MEW (Medium Early Warning) remoted scopes and vertical plotting board or that SCR 584 with the almost human automatic plotting board attachments. Other comforts which surely can be appreciated are static free, frequency modulated radios used in ground point to point contacts and the dependable VHF (very high frequency) transmitters and receivers for constant contact between the pilot and the ground controller. All the above and many others too numerous to mention have resulted from the combined efforts of allied military and civilian ingenuity, perseverance, and persistance.

It would be well to bring out that technique in the operation of the warning nets and ground control radar was quite different in the Pacific areas as compared to the ETO (European Theater of Operations). In the ETO the situation was one of rapid movement over large ground areas and with an outstanding air superiority there was comparative freedom from enemy air activity. This resulted in ground controlled interception assuming a very minor role whereas there was a tremendous amount of close controlled bomb missions and intruder activity.

As opposed to that, in the Pacific areas where island invasions were following close one on the other and at times there was more than one invasion in progress, the degree of air superiority as enjoyed in the ETO did not exist, and the Kamikaze boys were an awful nuisance. It therefore followed that immediately upon invasion, about D+3 or 4, radar and ground control personnel and equipment must be landed. As quickly as possible an air tight aircraft warning and ground controlled interception net was to be established. This net was designed to give the maximum protection possible to the island being invaded and as far out from the island as the radar ranges would permit. Early aircraft warning and effective ground controlled interception was the primary mission of these radar areas whereas close controlled bombing and offensive missions were a strictly subordinate activity. Thus in the Pacific areas as compared to the ETO the versatility and adaptability of ground control and radar was again demonstrated.



Radar Equipment supplying firing data (Signal Corps Photo).


LOW LEVEL ATTACK THROUGH OVERCAST
HELLO FABRICATE, THIS IS SIDESLIP, OVER R/V.
ROGER FABRICATE, ZERO NINE ZERO SIDESLIP STANDING BY
ROGER RIPSAW FOUR, ZERO EIGHT FIVE SIDESLIP. SIDESLIP STANDING BY
HELLO GROUNDHOG, THIS IS SIDESLIP OVER PODUNK, IS YOUR COLUMN OF TRUCKS STILL AT Q 1234 ?
HELLO RIPSAW 4, SIDESLIP HERE, AIRBOURNE
FOR TRAINING PURPOSES WITH GOOD CEILING AND VISIBILITY, FABRICATE WILL VECTOR FLIGHT TO TARGET AREA ONLY FOR SUCH TARGETS AS GROUND CONTROL MAY HAVE ON SUCH OPPORTUNITY TARGETS AS ARE AVAILABLE
KRAUTS WILL SOON REALIZE THIS IS A SIGNAL FOR A/C ATTACK UNDER A 2000 FT. CEILING- SO IT SHOULD BE USED ONLY WHEN ABSOLUTELY NECESSARY.
ROGER GROUNDHOG, 2 MINUTES O.K. AM GOING STRAIGHT IN FOR ATTACK, FIRE 1 RED SMOKE SHELL ON TAR GET TO INSURE POSITIVE IDENTIFICATION
IT MAY BE NECESSARY TO ORBIT AT THIS POINT FOR FABRICATE TO LOOK ON
HELLO SIDESLIP, THIS IS FABRICATE - FLY ZERO NINE ZERO GROUNDHOG HAS A COLUMN OF TRUCKS FOR YOU AT Q 1234 STAND BY
THIS POINT WILL BE NOT LESS THAN THREE MINUTES BACK OF FRONT LINE (210 MPH INDICATED)
HELLO SIDESLIP, THIS IS GROUNDHOG, THE COLUMN OF TRUCKS IS NOW 30 MILES EAST OF Q 1234 WE ARE NOW FIRING COUNTER BATTERY ON FLAK IN THAT VICINITY- FIRE WILL CEASE IN 2 MINUTES OR ON YOUR CALL
RED SMOKE SHELL IDENTIFIES TARGET
HELLO SIDESLIP, RIPSAW FOUR HERE, FLY ZERO EIGHT FIVE, STAND BY.
HELLO SIDESLIP, THIS IS RIPSAW FOUR- YOU ARE OVER RENDEZVOUS 15, CALL FABRICATE ON SAME CHANNEL.
HELLO SIDESLIP, THIS IS FABRICATE- YOU ARE NOW OVER PODUNK- CALL GROUNDHOG OVER SAME CHANNEL FOR TARGET DETAILS
AIRDROME
FIGHTER CONTROL CENTER
FORWARD DIRECTOR POST
BATTLE AREA CONTROL UNIT
CORPS TALO FORWARD CONTROL TEAM
AS EARLY AS POSSIBLE DURING THIS TIME, GROUNDHOG WILL ALERT ARTILLERY FOR COUNTER FLAK FIRE
CONDITIONS
1 CEILING 1500 TO 3000'
2 VISIBILITY NOT LESS THAN FIVE MILES
3 TARGETS CLOSE ENOUGH TO FRONT LINE TO BE PICKED UP BY ARTILLERY OBSERVERS
4 ARTILLERY ALERTED TO CONDUCT COUNTER BATTERY FIRE ON AIR SUPPORT PARTY OFFICERS COMMAND.
REPRODUCED BY G-3 AIR TWELFTH ARMY GROUP
AFTER THE ATTACK
GROUND CONTROL & FLIGHT LEADER WILL DECIDE IF ANOTHER ATTACK IS TO BE MADE ON THE TARGET.
A) IF ANOTHER ATTACK IS TO BE MADE, FLIGHT LEADER WILL REQUEST FABRICATE TO PLACE FLIGHT OVER RENDEZVOUS POINT AND THE PROCEDURE WILL BE REPEATED
B) IF ANOTHER ATTACK IS NOT TO BE MADE AND SUFFICIENT AMMO REMAINS, FLIGHT LEADER WILL REQUEST FABRICATE TO VECTOR FLIGHT FOR ATTACK ON ANOTHER TARGET.
C) IF ANOTHER ATTACK IS NOT TO BE MADE AND SUFFICIENT AMMO DOES NOT REMAIN, FLIGHT LEADER WILL REQUEST HOMING FROM RIPSAW FOUR
NOTES
SHOULD FABRICATE LOSE FLIGHT AT ANY TIME DURING THE OPERATION, IT WILL BE NECESSARY FOR RIPSAW FOUR TO VECTOR TO RENDEZVOUS POINT TO AGAIN ESTABLISH CONTACT THE RENDEZVOUS POINT WILL CHANGE FROM TIME TO TIME AS THE TACTICAL SITUATION REQUIRES

Application of Equipment and Technique

Knowing now that the necessary equipment and techniques have been evolved it would be well to take a brief look at the specific applications to which they have been put to effect the success of the allied war effort.

Prior to and by VJ-day some of the many tactical offensive air missions being performed with clocklike precision may be enumerated in part as follows:

a. Dive bombing under weather conditions which prohibit visual identification of the target by the pilot. This is controlled from an SCR 584 with automatic plotting board located usually at either a forward director post or battle area control unit. (See sketch on page 32.)

b. From this same control point, directing fighter bombers onto target for level bombing under conditions of poor visibility or at night.

c. Directing photographic aircraft to a pinpoint for night photography.

d. Tracking reconnaissance aircraft by MEW or SCR 584 so as to "pin-point" targets picked up and reported in by the pilot of the reconnaissance plane.

e. Directing flare carrying aircraft to a target at night illuminating the target for attack by following bombers.

f. Directing night intruders to targets for visual identification and attack.

g. Ground controlled direction to target and automatic bomb release through overcast or at night.

h. Numerous other specialized missions some of which still remain classified.

Many applications of radar and control were used defensively. Some were as follows:

a. Located enemy flights and direct fighters to intercept and destroy either by day or night. This is most effective with a MEW which is extremely accurate, long-range and can handle several intercepts simultaneously yet continue to provide early warning. The LW is also used for Ground Controlled Interception as are many British type sets, such as the Ames models.

b. Radar controlled searchlights spotted enemy bombers at night without search.

c. Antiaircraft artillery fire controlled by the familiar SCR 584 combined with a radar fuzed shell spelled doom to enemy fighters, bombers, and "Buzz Bombs."

d. Mortar fire and artillery fire was tracked to its firing points locating the gun position for elimination by allied artillery or bombers. The TPQ-3, modified AN/TPS-3 does this as does the SCR 584.

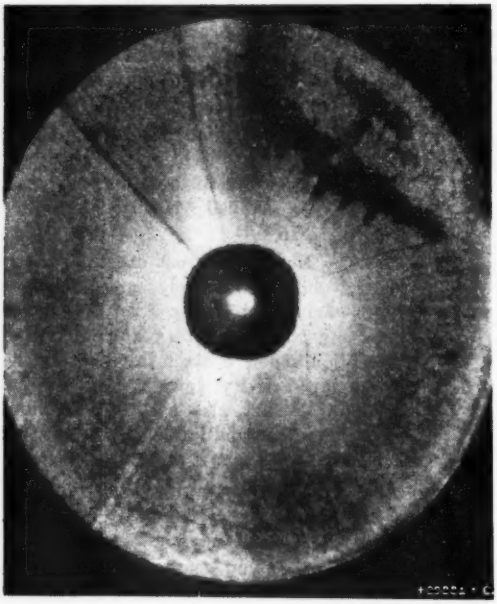
e. The Navy is a great user of radar and control both offensively and defensively. Ships carry radar and control equipment for detecting enemy flights and making the interception. Their control ships controlled all army air activity initially in the island operations. They also use it for control of all types of automatic and heavy gun firing, detection of enemy and identification of friendly shipping.

Strategic air operations use radar extensively. They do not, however, incorporate the use of ground control such as does the Tactical Air. They are linked to the ground as their airborne radar APQ-13, APS-15 and others all pierce the clouds and reveal the landfalls and terrain features over which they fly.

That property of airborne radar lends itself to many uses, some of which are: bombing from all altitudes through overcast or night, laying of mines in harbors, locating and bombing shipping including submarines, locating and analyzing enemy radar, mapping of enemy territory through overcast. It also provides exact altitudes over land masses instead of above sea level and numerous navigational aids to help insure completion of long-range missions under very adverse conditions.

One of the mostly highly prized activities utilizing radar and control is that of GCA, Ground Control Approach. This equipment has demonstrated its effectiveness in both ETO and in the Pacific areas. It picks up aircraft which are either in distress and in

overcast, or lost in zero conditions and guides them by ground voice control and GCA radar to the very end of and onto the top of the



Unusual Radar Scope Photograph. (U.S. Army AAF Photo.)

overcast runway. A set of some eight units in operation only a short time in the ETO successfully completed approximately 417 aircraft approaches and everyone knows of the B-29's in distress on the way back from Tokyo being saved on the little island of Iwo Jima.

Postwar Outlook for Radar and Control

Having so faithfully and well demonstrated its ability and served the allied cause to a crashing finale, this valuable instrument should not be allowed to disintegrate in the archives. There is no doubt that such will not happen in the case of radar and control.

Commercial industry and utilities will use and develop many uses for the application of the principle of radar. Railroads, power companies, and many households will feel the benefits of this wartime development.

In addition to wartime application, radar and control will find itself in many important peacetime jobs.

Ground Control Approach units which were discussed herein previously had and still have, to a degree, an inherent operating characteristic detrimental to its most efficient operation. This was considerable "hash" or fuzzyness on the base line of the indicating scope at very low altitudes. This meant that hair line control so necessary in the final few feet of the let down was hard to maintain. This characteristic is being worked out so that clear, accurate control can be maintained throughout the complete landing. No doubt that this type of equipment will be installed and used extensively throughout the world and will aid materially in defeating the bad weather hazard to flying and insure safe blind landings.

"Loran" and "Gee" are names of navigational aid systems utilizing radio and radar principles and where installed cover large areas of ocean and air. The system makes it possible for the captain of a ship or the pilot of an aircraft to locate himself in the air or on the water at any time. The installations of these systems are being expanded and will eventually provide practically world wide coverage.

With the ever increasing air activity, especially international, it does not seem unlikely to expect that there will be many efforts to fly in contraband especially over our northern and southern borders and at night. Possibly we may see the utilization of control radar to discourage this activity by detection of the flights and effecting their interception.

A great amount of gratification can be felt by the entire civilized world that such knowledge and perseverance was displayed several years ago and resulted in an instrument which

assisted very materially in bringing about the most complete and decisive elimination of the devastating threat to our civilized way of living and remains as a sturdy tool to effect a greatly improved way of living and help insure a lasting peace.

I have said that Ground Forces would benefit by additional teamwork. Infantry and artillery—and I was an artilleryman for many years before the war—are not self-sustaining; they cannot operate independently even on land; they must support each other at all times and together must receive support from armor, engineers, mechanized cavalry, and other dependent, supporting branches. The Air Forces, like the integrated Ground Forces, is self-sustaining and can operate independently. The strategic bombing of Germany and Japan were independent actions on the part of the Air Forces with its dependent branches—fighters, bombers, and reconnaissance planes. The Ground Forces recognize this strategic battle role of the air which must be successfully conducted before the infantry and artillery can close with the enemy.

General Jacob L. Devers

The Nation's state of unpreparedness along with that of the British Empire gave the Axis nations an overwhelming initial advantage in matériel. The Japanese campaigns in China, the Italian campaign in Ethiopia, and the participation of German and Italian troops in the Spanish Civil War afforded these enemies an opportunity to test their new weapons on the battlefield. There is a matter of very great importance, preliminary to decisions for quantity production of any weapon. Since we had some time in which to mobilize our resources, the vastly superior industrial establishment of the United States eventually overcame the initial advantage of the enemy.

During the past two years the United States Army was well armed and well equipped. The fact is we dared to mount operations all over the world with a strategic inferiority in numbers of troops. Were it not for superiority in the air and on the sea, in mobility and in firepower we could not have achieved tactical superiority at the points chosen for attack nor have prevented the enemy from bringing greater forces to bear against us.

General of the Army George C. Marshall

"It Takes Courage"

MAJOR PHILIP M. PARTHEMORE, JR., *Field Artillery*
Instructor, Command and Staff College

THE world gasped and was astounded at the losses we sustained in our island operations in the Pacific. It was the work of the "Under Water Demolition Teams" that prevented our casualties from being greater than they were.

Few of our assault forces saw them operate, fewer knew they even existed.

Betio Beachhead (Tarawa) was the bloodiest affair in history up to that time. Our losses were extremely heavy. The Navy was severely criticized for the operation; but, as a result of this history-making battle the "Under Water Demolition Team" was born. We learned at this time that the best high-performance aircraft, carrying the most up-to-date photographic equipment, coupled with the other agencies and sources available for the securing of military information, could not replace the information obtained by an observant individual on the ground.

Just as the Army sends out patrols to secure information of the terrain and defenses to their front, the Navy found that they had to do likewise in order to fulfill completely their responsibility of setting down on the beaches, with the minimum of casualties and equipment loss, the assault forces who were to secure the island. This was the greatest lesson of the Tarawa operation and in the future operations the Navy fulfilled her mission, thanks to the work of the "Under Water Demolition Teams" (UDT).

The personnel of the UDT are all volunteers, extremely powerful swimmers, and possess at the completion of their training, a thorough working knowledge of explosives and underwater demolitions, topography, and hydrography. In addition, the individual had to be observant and possess courage.

Possessing the above qualities and working directly under COMPHIBPAC [Commander Amphibious Forces Pacific] a normal mission for the UDT was as follows: "Reconnoiter approaches to the assigned beaches, remove natural and man-made obstacles and anti-boat mines to facilitate the landing of troops and materials." Breaking this down and viewing the essential elements of information desired by the Commander of the task force the information to be obtained looked like this:

1. Determine the presence of man-made obstacles, approximate location, spacing, number, rows, and interval between rows.

2. Determine the location of natural obstacles to landing craft operations.

3. Estimate the ability and time required to clear the approaches to the beaches.

4. Material of the bottom and the gradient.

5. Width, gradient, and material of the beach proper. Contour of the beach and an estimate as to what type vehicle it will support.

6. Estimate direction and velocity of current.

7. Location and description of all enemy fortifications and strongpoints.

8. All information as to the surf.

9. Estimate of locality suitable for placing ponton causeways.

As much of the above as possible was photographed and immediately sent out to destroyers covering the work of the UDT for immediate development and study. In addition to securing information, making estimates and determinations, the UDT was responsible for removing the natural and man-made obstacles to the contemplated operation. The UDT supplied the G-2 and TIC [Target Information Center] with the location and identification of targets that they observed. They marked approach lanes to the beaches and furnished the beachmaster of each battalion beach with that platoon of the team which reconnoitered that beach originally to advise the beachmaster and to accomplish any demolition and hydrographic work that was desired.

It is easy to see that with a mission such as the above, the personnel of the UDT were not just ordinary run-of-the-mill Naval men. They were all specialists. Specialists in beach reconnaissance, specialists in destruction, specialists in bravery.

What type organization was it that received and carried out such extensive and complicated missions? As yet, that information has not been made available. However, from a Japanese document captured on Okinawa dated September 1944, an organization, the result of interrogation of an American POW, is presented:

PERSONNEL	EQUIPMENT	OPERATING TECHNIQUE
Per Platoon	2 anchors	The dynamite needed is connected with steel wire and placed on reef.
4 LVP's (16 men to squad)	1 magnetic detonator	
8 swimmers	28 ft of netting and dynamite	
3 conning crew	steel wire hand grenades	The channels are blasted by a charge which is detonated from a detonator in the boat.
5 boat crew		
Total 64 men	Inferred that this is boat equipment	It usually takes 15 min to demolish a reef 50 ft long, 30ft wide and 8 ft deep.

From other sources of material the writer has determined the UD squad to consist of eighteen men and the boat and personnel equipment depended on the magnitude of the operation to be performed. Essential equipment was determined to consist of the following:

1. LCPR's [Landing Craft Personnel]—main operational craft.
2. Rubber boats—secondary auxiliary craft.
3. Individual knives—personal defense weapon.
4. Underwater goggles or masks—observation under water.
5. Rubber swim fins—swimming facility.
6. Rubber bladders—for floating demolitions.
7. Primacords.
8. Fuzes.

How did the UDT operate? A typical operation might be as follows: Upon the receipt of the operational directive a thorough study would be made of all existing photographs of the beaches in question. Operational craft (LCPR's) would be transported to the operation area in APD's, escorted by DD's, DE's, and the other craft that would furnish NGF [Naval Gun Fire] support while the UDT made their reconnaissance or performed their demolitions. Upon reaching the operational area, personnel and boats would be unloaded from the APD's 5,000 yards from shore and proceed at once to the LCI(G) [Landing Craft Infantry (Gun)] line which would be 1,000 to 2,000 yards from shore. Escorted by the LCI(G) and assisted by NGF support from these and the DD's and other fire support craft the LCPR's would proceed toward the beach. At the same time air strikes would be placed on known and suspected targets. At 1,000 yards from the beach the LCPR's would turn parallel to the beach line and start discharging their swimmers and demolitions. On leaving, the LCPR personnel go over the side into a rubber boat and thence into the water on the shore side; simultaneously the charges to be towed ashore, if the operation is one of demolition, are thrown off to the seaward. The craft does not stop once it starts the beach run; consequently, the personnel must leave a fast moving craft.

The swimmer swims ashore towing the required charges, secures fuzes, and attaches the primacord, and then swims out to the pick-up area which is from 300 to 1,500 yards from the beach, unless he is chosen as a fuze puller. He is picked up on the run, being swung aboard the rubber craft by a snatcher and thence into the LCPR.

Should greater quantities of explosives be required than the normal three towed by a swimmer, one of the following methods might be employed:

1. *Float-a-hose,* in which sixty tetryal packs are attached to a hose, towed behind a rubber

boat, which in turn is towed behind the LCPR. At 300 yards a swimmer goes over the side with a line which is attached to the hose. He swims ashore with the line and pulls the hose in when he is ashore or on the reef.

2. Rubber-boat deck, in which fifty tetryal packs are lashed to the bottom of a boat deck in an easily "cut free" manner and transported ashore as in the above method. Other methods are employed but will not be discussed at this time.

How are the charges fired? There are several methods; the more common being:

1. All fuzes being pulled at a prearranged time by the swimmers, fuzes being timed.

2. When all beaches signal "ready" the fuzes are pulled by the fuze pullers who have remained for this purpose.

3. Emergency firing would be performed when any platoon is certain that they have been discovered by the enemy.

Other operational practices that are common to the UDT's are: The reconnaissance and demolition operations are performed entirely on a predetermined time schedule. A simple yet complete signal system is in effect on all operations and includes arm and hand signals, radio, and, for night operations, colored lights. Often the Marines send their reconnaissance platoon along with the UDT to secure information to be used by the troops. NGF support is coordinated by an officer from each UDT platoon who stays aboard an LCI(G) and overwatches his swimmers. Most personnel of a team are qualified NGF observers and call for and spot fire on any targets that may present themselves.

Operations such as this with no personnel defense except water certainly takes courage and the UDT is possessed of so much that they prompted the following remark from the Japanese: "The enemy is taking us unaware more and more, and in addition to selecting landing points at sites which make it necessary for us to revise our views regarding military geography, they are carrying out detailed reconnaissance of other areas and leave no stone unturned in overcoming obstacles. We cannot ignore the thorough manner in which they carry out advanced preparations."

The strategic theory, as applied to the United States air warfare concept, postulates that air attack on internal enemy vitals can so deplete specific industrial and economic resources, and on occasion the will to resist, as to make continued resistance by the enemy impossible.

The real effect of our strategic air assaults, unlike that of tactical air attack, was seldom immediately apparent. Its effect was more like that of cancer, producing internal decay ultimately resulting in death.

Strategic air assault is wasted if it is dissipated piecemeal in sporadic attacks between which the enemy has an opportunity to readjust defenses or to recuperate.

Operations of an air force can no longer be considered as being local in extent or limited in range. Bombers can now range the world, and we must have the necessary facilities such as well-equipped bases, meteorological information, communications and other devices including radar, to provide for such employment.

Air force is a complex combination of many types of airplanes, weapons, personnel, units and tactics, supported by the industrial and scientfic resources of the nation. New weapons and new developments, including the use of atomic energy, have not basically altered this principle of modern war. This country must plan and build its military establishment with full knowledge that the methods of waging war now are changing at a rate never equaled in history.

General of the Army Henry H. Arnold

The Administration Center Comes Into Its Own

LIEUTENANT COLONEL S. J. ROGERS, *Adjutant General's Department*
Adjutant General, 3d Infantry Division

THE Third Infantry Division landed on the shores of North Africa on 8 November 1942, the first D-day of the European-African-Middle Eastern Theaters, as a part of the vanguard of American forces that was to pave the way for the full employment of our arms against the German Army. It landed on the beaches of Fedala, French Morocco, after a direct crossing from the United States, and it landed fighting. Except for a small group of key personnel, it landed minus its administrative sections, which remained behind in the States as follow-up troops. For over six weeks the division was without its personnel sections, its administrative records, and the bulk of its Adjutant General, Finance, and Judge Advocate offices. That was over two and one-half years ago. Since that time the division has participated in eight major campaigns, including three other amphibious operations, and it has learned to include the "paper war" in its planning. For it has learned that administration, like supply, is in direct support of combat operations. Shortly after this first combat experience in February 1943, the Division Adjutant General organized the Administration Center as the solution to the problem. The plan was simple. All units of the division "lost" their personnel sections to division control. They were detached and assembled together in a separate, functional echelon, under the supervision of the Adjutant General. The Center was composed, then, of the Adjutant General, the Staff Judge Advocate, the Finance Office, the APO (Army Post Office), and all unit personnel sections. It was to move as a unit during combat operations and to function as close to the front as security of the permanent records would logically permit. It has operated that way ever since and it has proved itself the solution to administrative control problems and particularly to personnel accounting and casualty reporting.

The first real test of the Administration Center was made during the Sicilian campaign in July and August 1943. The division assembled in the Bizerte (Tunisia) area for training and staging for this operation. Reinforced by many attachments into a large Task Force, the problem of administrative control of the division required considerable planning. The Ad Center was located in the heart of the staging area. All attached units were directed to have their personnel sections report to the Center, where they set-up shop. Conferences with personnel officers and adjutants developed a method of personnel accounting which has since been the backbone of casualty control. A mimeographed "work-sheet" morning report was devised for the use of organization commanders and first sergeants in the field. This became the basic memorandum for the personnel officer, who as custodian of the morning report, prepared it from that memo, *and from other basic source records available to him.* It was recognized that the company commander could only report what he knew, or what his men reported, and in battle that is too often not enough. The other records used by the Personnel Officers in preparing the official morning report and casualty reports were battalion aid station blotters (listing all patients treated, showing diagnosis, whether a battle casualty, and disposition), clearing station admission and disposition reports, and Grave Registration reports. All of these records proved vital in personnel accounting and casualty control.

The division landed in Sicily on 10 July 1943. The Ad Center followed two weeks later. During that period, a courier service was established between Sicily and Africa to bring "work-sheet" morning reports, and all other reports to the Ad Center for processing. A casualty control section had been established in the office of the Adjutant General to insure that unit personnel sections verified the status of casualties prior to submitting official reports. This was controlled

by locator cards, on which pencil entries were made from all the above mentioned records, which passed through the Casualty Section prior to being turned over to personnel sections. Thus any casualty report could be checked against these locator cards and any discrepancy caught. When the Ad Center caught up with the division, it was already across the island, having taken Palermo, and was preparing for continued action. Setting up in a school building in a small Sicilian village, the Ad Center functioned during the rest of the campaign in that one locality. Its only communication during the advance to Messina was by motor messenger and at the end of the campaign the courier was making a 200-mile round trip daily. It maintained that communication, obtained its reports from the units in the field, and took care of all administrative matters. It was a functioning service echelon, and it proved itself in this campaign. One of the secrets of its success was the establishment of an AG (Adjutant General) Forward Control Section at the Division CP (Command Post). This section was the necessary link between the units and the Ad Center. With one officer and three enlisted men, it operated as a message center, collecting "work-sheet" morning reports from the S-1's, aid station reports, clearing station reports, and GRS (Graves Registration Service) reports. In addition to this function, it took care of "red-hot" items, where phone calls could save days of delay. Gradually this section developed into a highly organized group which performed many duties over and above those for which it was originally intended. But this is a subject for later discussion.

The termination of the Sicilian campaign came with the capture, by the 3d Division, of Messina on the Northeast tip of the island. Pulling back to an assembly area, the division "shook down" and reorganized. The Ad Center continued to operate as a unit, and organization commanders were by now familiar with its operation. During this reorganization period, strict personnel auditing was made to review all missing in action reports and to complete records on all casualties. During this period, the Salerno landing in Southern Italy was made by other units. Due to unexpected resistance, and the critical status of that beachhead, the 3d Division was alerted overnight and moved into that fight. This left the Ad Center stranded in Sicily, dependent upon officer courier service between the island and the mainland to get reports in. This was not entirely satisfactory, but it was impossible to obtain any priority for the movement of the Ad Center during that critical period. Almost a month passed before shipping space was obtained, and the Ad Center moved to join the division. During this period, reports from the field were collected at the AG Forward Control Section and sent by officer courier whenever possible. Sometimes, however, there would be a break of three or four days when no reports could be sent due to the fact that the courier had to "promote" his own rides. There was no daily messenger service scheduled. It was during this period that one could see how difficult it would have been to maintain effective control if there had been no Ad Center and the personnel sections had been with their units.

The Ad Center followed the division in its advance from Salerno to the winter line south of Cassino. It moved very seldom, and was never less than ten nor more than fifty miles behind the front lines. Messenger service was good. The officers and men by this time looked at the Ad Center as a place where they could straighten out personal affairs, get paid, mail packages, obtain legal advice, and in general take care of any and all matters that require administrative assistance. Commanders could draw their payrolls and bring back soldier's deposits and money orders to the same locality. Pass groups could stop in for partial pay if required.

At the end of this phase, the division was assembled near Pozzuoli, Italy and prepared for a difficult landing operation far behind the enemy lines. This was to become the famous Anzio Beachhead. From the landing on 22 January 1944, until the capture of Rome, the Ad Center operated at Pozzuoli,

over 100 miles away, with no land route open for communication. By this time the Administration Center had a radio link with the division net. Courier service was by ship. During this difficult four-month period, when the hardest kind of fighting and the heaviest casualties occurred, the AG Forward Control Section was on the beachhead, obtaining casualty information and getting it back to the Ad Center. It was during this trying period that this Forward Control Section developed into its present capacity. It not only collected and dispatched casualty records, it supervised and controlled the assignment of replacements. It handled many administrative matters including letter orders, reclassification cases, cablegrams, and publication and distribution of important directives. Further, it published and distributed G-2 and G-3 reports to the command. This section often worked sixteen hours to eighteen hours a day during this period, under frequent artillery fire and air raids.

After the division entered Rome, it was assembled again in the Pozzuoli area and began training for its fourth major amphibious operation, this time, D-day in Southern France. This presented certain definite administrative problems. The Administrative Center was left behind in Pozzuoli, scheduled to move on D plus ten. The distance by surface craft was approximately 400 miles. The problem of communication was solved by the landing of the AG Forward Control Section on D-day, and the establishment, by Seventh Army, of a daily courier plane service between the far and near shore control. This enabled the division to forward initial casualty reports on D plus 2 to Italy, and enabled the Administration Center to forward complete Battle Casualty Reports on D plus 4 to Seventh Army, the first divisional reports to clear from the D-day operations.

The Administration Center arrived in France on 30 August 1944, fifteen days after the D-day landing. By this time the division was well over 200 miles inland. The Ad Center moved from the beachhead to Grenoble, France, only to find the division had pushed on another seventy-five miles. During this period radio linkup and messenger service was maintained, and in spite of the distance, reports were processed on time. It is interesting to note in this regard, that the Seventh Army utilized cub plane service from its CP to its Rear Echelon near the beach to get those reports forwarded to Italy. Plane courier service proved a great aid in overcoming the tremendous distances involved.

Since the D-day landing in Southern France, the Ad Center has followed closely behind the division in its moves up to Strasburg through the Vosges Mountains, and in the entry into Germany terminating in the capture, by the 3d Division, of Berchtesgaden and the end of the European War. At times it has been abnormally far behind the division, due to rapid advances and priority of transportation. At other times it has been under artillery fire. In spite of any situation, it has functioned efficiently. It has done its job in relieving unit commanders of a great deal of administrative responsibilities during combat, has enabled this division to maintain the desired standards in administration by close teamwork between the various sections, and supervisory control of personnel sections exercised by the Adjutant General.

Naturally, when twenty offices are assembled into a center, certain housekeeping problems come up. As an Administrative Center is not a T/O organization, all overhead personnel and equipment necessary to maintain such an installation had to be obtained from the units. Today the overhead personnel consists of:

1 Officer (Headquarters Commandant, under Special Troops)
1 First Sergeant
1 Orderly Room Clerk
1 Medical Technician
1 Supply Sergeant
1 Articifer
1 Motor Pool Sergeant
1 Motor Mechanic
1 Electrician
1 Mess Sergeant
9 Cooks
2 Bakers

7 KP's
1 Stove Mechanic
1 Typewriter Repairman.

This overhead personnel provides clothing, food, and shelter for twenty-eight officers and 420 enlisted men. In addition, due to heavy transient visitors from the units, it often feeds well over this number.

Experience of the 3d Infantry Division, in eight major campaigns in Africa, Sicily, Italy, France, and Germany have proved that an Administration Center is the answer to the problems of Combat Administration. Many valuable lessons have been learned about the mechanics of administration during this period. One of the biggest lessons learned is that the T/O&E's are still inadequate for the burden of administration that falls upon a unit in combat. Personnel sections of infantry regiments have an inadequate T/O to perform their mission efficiently. The same is true of the Adjutant General's office. There are no provisions made for the personnel and equipment required to process casualty reports, awards and decorations, and particularly, the excessive turnover of personnel records due to combat losses. Administration in combat is greater in volume than it is in garrison, primarily due to the tremendous turnover of personnel. Unfortunately, no increase in personnel or equipment has been authorized. As a result, it has been necessary to augment these sections with personnel placed on special duty from the units. Proper action, of course, is to revise T/O in recognition of these essential duties during periods of war.

Commanders are apt to be impatient with administration during combat. As they are concerned primarily with the mission of destroying the enemy, it is right that they should have a special staff to take care of their administration. It is practical that this special staff, both of the headquarters and its organic units, be concentrated into an Administration Center, where maximum efficiency can be maintained. The development of the Administration Center in this war has paid dividends. It has also raised some interesting questions. Administration is a special branch of its own. It is difficult to train men to replace this personnel. Line officers are not trained in administration. They are trained to lead men in combat. One of the biggest personnel problems has been to find qualified personnel officers and clerks who know the basics of army administration. The Administration Center has brought with it this question: "Why not have an Administrative Corps?"

Why should a personnel officer be an infantry officer? If an infantry officer is assigned to the job, the infantry has lost the services for which he was commissioned. It would be better to establish an Administrative Corps, and have trained administrative personnel assigned to unit personnel sections. It is a definite service of its own, just as much so as Quartermaster, Signal, or Ordnance. It should go further than the present limitation of the Adjutant General's Department. It should go down to small unit admininstration. Limited assignment personnel could well be trained for many of these administrative positions and thus be assigned to duties which are commensurate to their physical limitations. Someday, perhaps, this will come to pass. We have learned important lessons from this war, and no doubt will apply them to good use. Our army will be maintained in the postwar period, at considerable strength, over widely separated areas. Administration will continue, with more emphasis being placed on it than ever before, and it will provide a challenge to the organizing abilities of members of the Adjutant General's Department. The Administrative Centers established in this war may well be the first step in the development of an Administrative Corps. In any event, the Ad Center is a functional service unit and it is here to stay.

Photographic Reconnaissance for the Fifth Army

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SOME months ago there appeared an article in this publication by Major Quello which outlined in detail the organization and operations of tactical reconnaissance aviation for the Fifth Army in Italy during the spring and summer of 1944. The article mentioned the Photo Reconnaissance Unit (or PRU as it was called) but did not explain the organization and operations of photo reconnaissance aviation for the Fifth Army. It is the purpose of this article to make that explanation.

An explanation of photographic reconnaissance operations for the Fifth Army requires some review of the organization and operations of the Mediterranean Allied Photographic Reconnaissance Wing. This Wing (usually spoken of by the short title MAPRW) was the centralized organization controlling all photographic reconnaissance units in the theater and responsible for meeting the photographic demands of the theater. These demands may be roughly divided into two categories, strategic and tactical.

Demands from Fifth Army as well as other headquarters in the theater for strategic photo reconnaissance were screened and executed through the Wing Headquarters. This channeling of demands through the Wing Headquarters had the advantage of making possible a coordinated and efficient operation by screening out unjustified and duplicate demands. It had the disadvantage, however, of causing a loss of many hours while requests, orders, and resulting information and photographs were transmitted over already overloaded communication facilities. In tactical operations this disadvantage was overcome by authorizing a subordinate unit of the Wing direct communication with each headquarters which had a large volume of high priority demands for photo reconnaissance of tactical nature. Insofar as possible the unit was based on an airfield near that headquarters in order to facilitate direct communication. The 12th Photo Reconnaissance Squadron was so authorized and "earmarked" for work with the Fifth Army.

Within the Fifth Army, photographic reconnaissance activities were coordinated by PRU. This unit consisted of an officer in charge, an assistant, three officer photo interpreters and a small number of enlisted men to carry out administrative functions. The organizations and elements with which PRU had close contact were the Photo Interpretation Teams which were attached to Division and Corps Headquarters, the G-2 Target Section and the Fifth Army Photo Center. Before more can be said about the operations of PRU the organization and operations of the units just mentioned must be outlined.

The Photo Interpretation Teams consisted of two or three officers and one or two enlisted men, depending on the work to be required of them. They were assigned to Photo Intelligence units of the MAPRW and attached to Division, Corps, and other headquarters for duty as required. Some of these teams were British and some American. It was necessary that British interpreters be used by the Fifth Army in the North African campaign because the British interpreters had experience which ours lacked. The use of the British interpretation personnel proved so satisfactory that their services were retained throughout the entire Italian campaign. The percentage of American interpreters in use, however, in the latter stages of the campaign was in the majority and rapidly increasing. The practice of having all interpreters assigned to one organization and then attached to various headquarters for duty differs from presently approved doctrine; however, it worked very satisfactorily in the Mediterranean Theater. It had the advantage of making the use of Allied personnel easier from an administrative point of view and allowed a greater flexibility in their use as they could easily be attached to the unit or headquarters whose

need was the most acute. This flexibility resulted in the high degree of efficiency necessitated by the ever present shortage of experienced interpretation personnel.

The G-2 Target Section consisted of two officers and two enlisted men from the Fifth Army G-2 Section and the three officer photo interpreters and one enlisted man of the PRU. It was formed shortly after the execution of the Anzio operation. Its primary function was to locate targets suitable for long-range artillery and close air support. It not only located these targets but prepared annotated prints of them to be furnished to the Artillery and XII Air Support Command working closely with A-2. The G-2 members of the Section were responsible for collection, collation and evaluation of information on artillery and close air support targets from all ground sources and transmission of this information to the photo interpreters. Their main function, however, was to classify and maintain complete records of all evaluated target information whether from ground sources or from the photo interpreters and transmit this information to the Army Staff, XII Air Support Command and Army Air Support Control. The photo interpreters were responsible for checking all target information obtained from other sources, for locating targets not reported from other sources and issuing reports on all targets. They prepared annotated prints of these targets and made arrangements with the Fifth Army Photo Center for quantity reproduction of the annotated prints and distribution to the XII Air Support Command, Fifth Army and their subordinate units. After air strikes and artillery shots they assessed damage done to close air support and artillery targets for the information of Fifth Army Headquarters.

The Fifth Army Photo Center was perhaps the most important organization whose activities were coordinated by PRU and it was certainly the most unorthodox at the time of its formation. I say at the time of its formation because the idea of the photo center (whether by that name or another such as Photo Intelligence Detachment) was later adopted with very little modification by all American Armies in Europe and is now recognized by approved doctrine. The Fifth Army Photo Center was the organization at Army level responsible for interpretation, reproduction and distribution of aerial photographs and information resulting from aerial photographs. It also maintained liaison with the 12th Photo Reconnassance Squadron which did the flying. It consisted of the following sections:

a. The Army Interpretation Section.—This section (made up of a team of eleven officer photo interpreters) prepared general interpretation reports for distribution to all echelons and such special reports as were required by Army Headquarters for planning purposes. These reports were supplemented by the work done by the interpreters at Corps and Division. It also prepared overlays for overprinting enemy defense maps published periodically under the direction of Army G-2.

b. The Ground Liaison Section.—This section (composed of two officers) maintained liaison with the 12th Photo Reconnaissance Squadron passing on to it all requests for flying. These Ground Liaison Officers also assisted in briefing and interrogation of the pilots who flew the reconnaissance missions.

c. The Survey Detachment.—This detachment worked out exact coordinates of enemy artillery positions and other installations located on photographs.

d. The Engineer Detachment.—This detachment (composed of two interpreters) specialized in obtaining information for use of the Fifth Army Engineers.

e. An Assistant Counterbattery Officer from each Corps.—These officers forwarded information on enemy artillery positions directly to their Corps Counterbattery Officers by radio so that effective counterbattery fire could be carried out within as little as one hour after the return of the aircraft that took the photographs on which the positions were located.

f. The Clerical and Distribution Section.—The functions of this section are implied by its name.

g. The Radio Unit.—This unit transmitted

information directly to Army Headquarters or subordinate elements such as Corps Counterbattery Sections that had immediate need for it.

h. A Courier Section.—This section (consisting of three jeeps and drivers) delivered prints and written reports to the Army and Corps Headquarters.

i. The Processing and Reproduction Section.—This section was made up of the mobile laboratories of the 12th Photo Reconnaissance Squadron and a British Mobile Field Photographic Squadron. The 12th Squadron laboratories developed the film and made two prints for immediate use. Quantity reproduction of prints for distribution was accomplished by the British Squadron. The Photo Center was located adjacent to the airfield on which the 12th Photo Squadron was located rather than at Fifth Army Headquarters so that loss of time in getting film to the laboratory, processing it and making initial interpretations for hot information to be radioed to the using echelons would be held to an absolute minimum. There was, however, during periods of rapid advance when Army Headquarters was moving forward more rapidly than could the Photo Center and the 12th Squadron, a tendency for lines of communication between the Photo Center and Army Headquarters to break down. This difficulty was overcome by motorizing a small team from the Photo Center and the ground crew of a flight of one or two aircraft from the 12th Squadron and keeping them on the operational airfield nearest the Fifth Army Headquarters. This highly mobile team was used then only for the highest priority jobs where the utmost in speed was demanded. The more routine material was accomplished by the regular organization employing the longer and slower lines of communications.

Now to return to the operations of PRU. As you will recall from the above discussion of the G-2 Target Section, the three officer photo interpreters in PRU worked as a part of the Target Section. This left, in reality, two officers to carry out the functions of PRU. The senior of these two officers was trained basically as an air-ground liaison officer and the other as a photo interpreter. In addition to other duties the photo interpreter acted as adviser to the Fifth Army Staff on matters of photo interpretation. Both these officers were British Army personnel attached to the Fifth Army Headquarters for duty.

Perhaps the operations of PRU can best be explained by following its activities from the initiation of requests for photographs or photographic intelligence in the various echelons to the delivery of the photographs or intelligence to the echelons which could use it. Requests could be initiated in any echelon or headquarters in the Fifth Army. Below division level these requests were normally transmitted through intelligence channels. From the Division Photo Interpretation Team a request would normally go to the Corps Photo Interpretation Team and from there to PRU at Army Headquarters. An urgent request might be passed directly from Division to PRU. In PRU all requests were screened to eliminate duplicate and unreasonable requests. On advice of G-2 all low priority requests that would push the total demand beyond the photo units' capacity for execution were also eliminated. PRU then passed on such requests as were not screened out. PRU did not, however, merely wait to receive requests, screen them and pass them on. It made every effort to anticipate the needs of the Fifth Army Staff and the subordinate echelons. A PRU officer was present at all Army Staff and planning meetings. With this constant knowledge of current operations and future plans PRU was able to anticipate approximately 90 per cent of the Army's demands for photography and photographic intelligence. This practice of anticipating demands had two advantages. First, it gave the units who filled the demands more time in which to execute them, thus permitting better scheduling and consequent increased efficiency. Second, most of the photographic requirements of the staff sections and particularly subordinate echelons were filled before the section or echelon

found it necessary to make a request. This resulted in fewer requests and left request channels open so that when it was necessary to make a request it could be made easily and dealt with rapidly.

Whether received from another echelon or initiated in PRU in anticipation of a future need, all legitimate demands were passed on by PRU to the executing agency. Demands which I have earlier described as being of a strategic nature were passed on to MAPRW fo rexecution. Demands of a tactical nature were passed to one of the Ground Liaison Officers at the Photo Center.

Material obtained as a result of demands made to MAPRW was delivered to the Fifth Army Photo Center by daily air or motor courier. Distribution from there was the same as for material resulting from demands made on the 12th Photo Reconnaissance Squadron as explained below.

When an aircraft of the 12th Squadron returned from a mission, the film magazines were rushed over to the Photo Center to be processed. After assisting in the interrogation of the pilot, the Ground Liaison Officer followed them over with a copy of the interrogation report and a trace of the pilot's photographic flight lines for use as an aid in locating and plotting the photographs on a map. When the film was developed two prints were immediately run off. One of these went to the Army Interpretation Section; the other was plotted and could then be sent at once to Army, Corps, or, in emergency, to Division Headquarters by liaison aircraft. Later, additional sets, one for each Division, two for each Corps, one or more for Army and one for file at the Photo Center, were produced and distributed by courier jeep during the night. In the event the photographs were the first to be distributed to lower echelons of the area covered, they were considered to be "basic cover" and an additional number of sets were distributed. Depending on the desire of the individual division, the number of additional sets for basic cover ranged from thirty-six to 136 sets per division. Usually, the longer a division had been in action the more sets it required.

Information obtained from the first set of prints by the Army Interpretation Section was telephoned or radioed directly to all headquarters which could use it, thus short-circuiting channels and saving much time in getting the information where it was needed. In the case of information of enemy artillery, the assistant Counterbattery Officer radioed it directly to his Corps Counterbattery Officer. Complete written reports were sent out later with the additional sets of prints distributed by courier jeep.

It is important to note that all photographs were immediately interpreted at the Photo Center adjacent to the airfield from which the mission was flown and the results of the interpretation radioed to the using echelons. This information reached the echelons many hours before the actual photographs, giving them information that would have lost much of its value by the time the photographs arrived and could have been interpreted. Photographs, however, were still of great value at the lower echelons when they arrived, for there they could be given more detailed study developing more extensive information. They could also be used as supplement to the large scale maps.

The procedures outlined above for requesting, producing and disseminating aerial photographs and photographic intelligence were not rigid nor did they work automatically. It was the job of the officers of the Fifth Army PRU to initiate and supervise such changes in the procedures as were required by new campaigns, locations and personnel and to see that all of the elements involved knew their parts and performed them in coordination with the rest of the team.

The success and effectiveness of the organization and procedures employed in the operations of photographic reconnaissance for the Fifth Army is made a matter of record in a letter to the Commanding Officer of the Mediterranean Allied Photographic Reconnaissance Wing from the G-2 of the Fifth Army in which the opinion was expressed that approximately seventy per cent of the intelligence available to the Fifth Army resulted from photographic reconnaissance efforts.

"... Hold Out for Long Months and Years"

Some Japanese Maneuver Plans for the Lingayen Gulf Area, Luzon

A Japanese document captured at Ipil, Leyte Island, on 2 January 1945, consisted of a bound mimeographed file containing Japanese plans for maneuvers against an Allied invasion in the Lingayen Gulf Area of Luzon, Philippine Islands, and a discussion of conclusions reached concerning the Japanese defensive dispositions there. The following are extracts.

Enemy Capabilities

If the enemy plans landings in Lingayen Gulf we must expect that he will first establish ground troops on the west coast of Luzon north of Lingayen Gulf, and will then descend to the south by stages. Not only are possible landing places numerous there, but we know that our dispositions are inadequate to prevent landings.

The area about twenty kilometers inland from the coast is almost continuous plain and low hills, facilitating the movement of forces. In addition the enemy would be able to cut off our rear by a series of movements in small craft (see Chart 1). Also in view of the fact that the use of supporting naval gunfire is easy in this area, it is bound to be extremely disadvantageous to throw in the major part of our forces there.

The conclusion is that we shall not be able to prevent the development of a situation in which we must fight a land battle with an enemy army which has fully accomplished its landing. If we do not commit our immediate Lingayen Gulf dispositions too hastily, the foregoing battle situation will inevitably result. I we do, the enemy will be enabled to land directly at Lingayen Gulf and break through into the Central plain of Luzon at one stroke.

Terrain Estimate

If the enemy is allowed to penetrate the plains of Central Luzon they will be able to maneuver freely their overwhelmingly superior power, in particular their armored forces. We would have great difficulty in checking them in an all-out engagement. Since the sector of the west coast described above is comparatively confined, the enemy would not be able to deploy large forces there. Therefore, we shall check the enemy in the vicinity of the lower part of the east

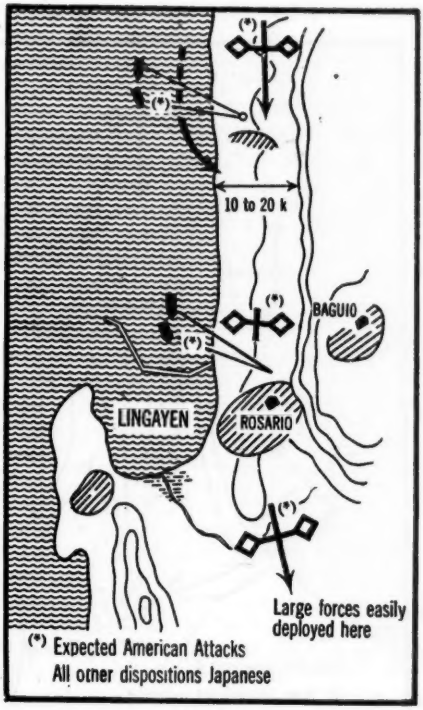

Chart 1.

side of Lingayen Gulf, so as to prevent his advance to the central plain of Luzon.

He will thus be unable to deploy his full strength. Further, it will be necessary to take the offensive, utilizing irregular and difficult terrain, planning this as a crushing attack. Until that moment we must manage to whittle down the powerful enemy warships and plan to launch the final destructive

smash against the warships simultaneously with the full offensive.

To accomplish the above the vicinity of Rosario is vital. Also to carry out this design it is particularly essential to secure Baguio and the peninsula on the west side of Lingayen Gulf.

Observations on the Rosario Vicinity

1. Problem of checking the enemy. Against an enemy advancing southward and eastward from the sea, the securing of the lines C-D and E-F is of primary importance (see Chart 2). Since the enemy's supporting fire from the sea will be very powerful this will be a difficult problem, but to secure the line A-B will be comparatively easy.

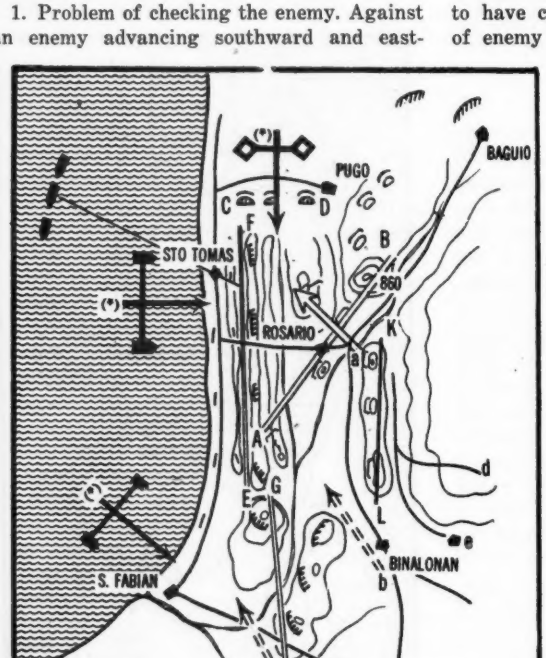

Chart 2.

2. The battlefield and the direction of the offensive. By holding the line A-B the offensive in this area will be extremely easy. As for an offensive in the "bc" area, being level land it would not be advantageous, since there would be the fear that we would be obliged to engage the enemy in a district where there are no considerable obstacles to tanks. On the other hand in "a" area we would be able to attack on terrain which handicaps enemy tanks. Also, since it will be possible to have comparative security from the fire of enemy warships, success is assured. For these reasons the terrain in the vicinity of Rosario is suitable.

3. Support for the offensive. From the above standpoint it is most desirable that the attacking group advance to "a" area from around "d" or possibly "c." For this purpose it is essential to secure absolutely the tableland around Rosario. Hill 860 is also a powerful key position. Since the above forward movement would be difficult if the enemy broke through the line G-H, it is necessary to have preparations made in advance to hold the line K-L. Furthermore, the course of advance A-C needs to be organized swiftly and well.

Value of Baguio

Assuming the above offensive is carried out, if the battle situation develops unfavorably for us and we find ourselves under continuous enemy pressure, we must be able to hold a route of withdrawal to the mountainous terrain around Baguio. Therefore, in order to hang on doggedly in the Philippines and await the plans of later years, it is necessary to organize quickly in such a manner as to be able to establish permanent installations which can hold out for long months and years. The mountainous terrain in the vicinity of Baguio is suitable for this purpose.

Air Power in a Tactical Role

MAJOR BEN L. PARKER, *Air Corps*
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LONG ago our leading airmen, with a great deal of foresight conceived the idea that the application of air power would divide itself into two basic roles, when brought to bear upon an enemy having all the ingredients necessary to promulgate a war. These ingredients include a land mass which would house the people, the raw materials, and the industries to furnish the necessary machines of war and the various supplies needed to keep this tremendous military might in the field. These men of vision knew that the destruction of the enemy's ability to wage war is a battle-winning factor of the first importance, but they also knew that when two land armies come in contact with each other, one must be deprived of its air arm while the other must have the air power available, applied in such a manner as to facilitate the ground forces in pursuing their mission with the least loss of life possible and with the utmost efficiency.

Types of Air Forces

With this fundamental concept, two major types of air forces evolved when this particular situation arose. In the European Theater of Operations we had an enemy which had conceived a war machine that was firmly backed up by its peoples and had been able to marshal all of the available materials and industries to further the work of this machine. Before the land armies became engaged, the air force for the strategical role was already being employed, and as soon as the land forces met, the air force for tactical operations came into its own. To understand further the role of the Tactical Air Force and the fundamental difference between it and the Air Force working on strategic operations, let us look at the basic employment of military forces and see how air power is used to supplement or to further the mission of all military forces.

Ground forces hoped to break through the enemy's resistance, cut his lines of communications, prevent him from being supplied or reinforced, and defeat his forces in the field, thereby causing his country to surrender. When two forces met, the only method of gaining the desired end was for one force to penetrate the enemy lines by massing a great force and breaking through, and after the penetration was made to fan out, straddle his lines of communications, capture his supplies, and move toward his industry and seat of government. The force defending his homeland then either had the choice of trying to regroup his scattered units, form another line of resistance; or bring more forces to bear at a certain point, in which in either case the whole process would have to be repeated over again by one force or the other. If the ground forces were unable to make this penetration, they had the alternative of an envelopment or flanking attack, again hoping to get astride his lines of communications, capture his supplies, and eventually defeat his field forces.

Practices in World War I

In World War I this process of either penetrating or flanking eventually worked itself into a stalemate, each side extending its flanks until the seacoast was reached on one side and the Swiss Alps was reached on the other. Once the two flanks were securely anchored, and it was impossible to envelop either flank, the war stabilized itself into a situation where penetrations were attempted by great masses of men and only a few yards of useless ground was gained with an extreme loss of life on each attempt. The third dimension was added by man in his search for more methods to accomplish the desired end by taking to the air.

In World War I the development of the use of aerial warfare was in its infancy. Between World War I and World War II the application of Air Power was determined, but the relationship of the Air Arm to the

other Arms was not clearly known until World War II. By the use of this other dimension the attacking force can not only envelop and penetrate, but also cross above the enemy's lines and attack his rear areas, destroy his lines of communications, and hit his industry and seat of government. With the advent of air power, we find that two basic employments are needed: one in which we strike deep into the heart of the enemy territory against the industry and population, and the other in which we strike against the enemy's ground forces, lines of resistance, lines of communication, and his air arm.

Effects of the Employment of the Air Forces

The results of one of these basic employments affect the economy and the political aspects of the country as well as its ability to wage war. This type of operation, because of its nature, is known as Strategic Operations. The results of these Strategic Operations may not become apparent for some months or perhaps a year after they have been carried out. The effect of the other basic employment has an immediate bearing upon the Tactical Situation and, because of the nature of the operation, is known as Tactical Operations. These Tactical Operations prevent the ground forces from being interfered with by the enemy air and enables them to carry out their mission as efficiently as possible and with as economical expenditure of life as the situation permits.

Although capable of working independently of each other, it was found in practice that the two air forces, although working on entirely different roles, supplemented each other with the results of their operations, and we can liken their cooperation to that of a boxer —a boxer with a wicked, beautiful left, which would be the Tactical Air Force jabbing and cutting, cutting and jabbing, hitting two or three times to each blow from the heavy mur-[illegible]ht, which would be the Strategic [illegible], either capable of the knockout both working together to get the [illegible]hape so that he will be an easy victim—bloody—weakened and bewildered—not knowing from what direction and in what form the next punishment will come. While the Strategic Air Force, with its fearful right, is flying to deeper targets and dropping far greater tonnages of bombs, the Tactical Air Force, with its left, is continually cutting and jabbing, flying more sorties per day, hitting more targets—smaller targets and with lighter bomb loads. While the Strategic Air Force would be going in, perhaps 600 miles to the industrial area, with from two to three-ton bomb loads, the Tactical Air Force mediums would be penetrating perhaps 350 to 400 miles, with two-ton bomb loads, and the fighters literally would be everywhere, cutting rail lines 200 or 300 miles from the front lines, or dive-bombing and strafing anti-tank gun positions a few hundred yards in front of our armored columns.

Knowing that an Air Force employed in Strategic Operations cuts down the enemy's ability to wage the war, and the Air Force employed in Tactical Operations cuts down the enemy's war machine, enabling our land forces to pursue their mission, let us determine in just what manner the Tactical Air Force carries out its role. It carries out its role primarily by, first, denying the enemy the use of its air arm; second, by isolating the enemy's land forces from their source of supply and reinforcement; and third, by directly assisting our ground forces in their operations of penetrating or flanking the enemy.

The first priority of denying the enemy the use of his air arm is accomplished by, first, gaining local air supremacy in which we deny the enemy the use of the air to enable our own medium and light bombers to attack his air fields, air installations, and supply dumps in grounding his air force. As soon as this is done, we are then able to employ a greater and greater percentage of our air force on the other two priorities. While we are gaining this air superiority, again we feel a close cooperation of the Strategic and Tactical Air Forces. The Tactical Air Forces, with its many fighters denying the enemy the use of the air, enables the Strategic Air Force,

with its large and long-ranged bombers, to penetrate deeply into enemy territory to strike at the industry building the airplanes, the aircraft engines, and producing fuel which the air force must have to operate. Once the air supremacy has been gained, it takes a relatively small percentage of our air forces to maintain it, but we must constantly hammer at enemy airfields, at aircraft production points, supply installations, etc., to make certain that the enemy does not wrest away from us the air supremacy which is so hard and costly to gain.

The Tactical Air Arm

Once we have gained air supremacy we now commence to employ our Tactical Air Arm in the second priority, that of isolation of the battlefield. This isolating of the battlefield has numerous advantages for the ground force, the main advantage being that it strangles the enemy's lines of communications, and causing any attempt to reinforce, supply or evacuate the area to fail, or to be accomplished in such disorder that the effect is nil. The most effective method of isolating the battlefields is the hitting of the transportation system. The effect of the results of this operation is the paralysis of the enemy when this interdiction program is complete. To be sure that the interdiction is complete, the interdiction should be carried out not in a single line but by being put in pairs of three or four parallels. This will cause the enemy to make its repairs on railroad tracks, bridges, highways, etc., in a number of places on each line of communication, rather than in just one place.

Assistance to Ground Forces

This isolation of the battlefield was presented in classic form in the Normandy Campaign. The Seine river, generally on the northern flank, and the Loire river, on the southern flank, almost met to form a watery perimeter around the battlefield. The space not quite closed by the two rivers was known as the "Gap"—between Paris on the Seine and Orleans on the Loire, and it was found that the enemy rail line running through the Gap included at least one bridge suitable as an aerial bombardment target. Every ounce of supplies reaching the German armies on the Normandy battlefield had to come over land or road bridges crossing the Seine and Loire, or through the Gap. Every bridge was photographed and assigned as targets. For the initial destruction about one-third was allotted to the 8th and the rest to the 9th, and the greatest bridge-destroying program in history got under way. Operations actually started before D-day but it had to include a "cover plan," or destruction of decoy bridges. The enemy must not know where our invading forces were to strike—it was admitted he knew the invasion was coming, but he must not know where or when. Hence, for every bridge attacked in the real plan, an attack of equal intensity must be placed on one in the cover plan, and bridges were destroyed in Belgium and in Holland, that had not the slightest bearing on the invasion, except that until the D-day Armada converged on Normandy, the enemy was wondering if it was coming to the low countries or Brittany or maybe Normandy. As soon as the 8th Air Force completed its allotted third of the bridges, the entire program was the responsibility of the 9th Air Force, including maintenance of destruction of all bridges after the Germans began to repair them frantically. His armies were dying for the want of supplies. Finally, the bridge program was complete—the only supplies reaching the German armies in Normandy were brought in by highway truck convoys that were dying out for the want of gasoline, as the murderous right of the 8th Air Force continued its magnificent and costly program of obliterating the German oil production—both natural and synthetic. Ruses were many, the favorite being night-operating bridges—rail bridges that clearly showed all of their decking or traffic surface destroyed; but night photography just as clearly showed this decking cleverly and temporarily replaced with huge truck convoys going over them. In the morning the bridges would appear as damaged and lifeless as the day before. Rail trans-shipment within the Seine-Loire pocket

was vital, due to the 8th's oil orgy. To stop this, two separate systems of rail lines between Paris and St. Malo were methodically chopped to bits by the 9th's bomb-lugging fighter-bombers, and the motor truck convoys were strafed and bombed until highways became funeral pyres.

The Seine-Loire pocket became an arid desert—a logistical No Man's Land. American and British ground forces reported under-fed prisoners, sparse enemy artillery fire, guns firing only at the most vital targets. German prisoners told how they moved swiftly from the south of France, or from the Russian front, in modern, comfortable trains as far as the perimeter of the pocket. Then they proceeded on foot, on bicycles, and in mule carts, and always by night and always under air attack. If they moved by day they were cut to pieces by the 9th's fighter-bombers. If they moved by night it was much slower, but they had a chance. Twenty-four to forty-eight hours by train to the Seine or the Loire was the usual prisoner's story; then a week or ten days on foot to reach the battlefront. Then they reached it as hungry, terrified stragglers, not as organized fighting units. This then, is isolation of the battlefield, and weakens the enemy to a point whereby our own well-fed, well-equipped ground force units can make their penetration with the least loss of life possible and with the odds in their favor.

From isolating the battlefield, we come to the next important step in assisting the ground forces in their mission, that of close air-ground cooperation. Unbelievably close coordination of air and ground units can be had if proper liaison, mutual understanding of the other's problems, and a will to cooperate exist between the air and ground commanders. This combination of air and ground units makes up an air-ground team which can become a vicious weapon that the enemy fears greatly, and if used astutely, we can bring about effective success for the common cause. There are many ramifications in carrying out the actual operations of an air-ground team, and many and various agencies, organizations, and controls are needed to utilize it effectively. Once the complicated units become a homogeneous whole, the team is a battle-winning combination.

This was demonstrated again in classic form in France when General Patton and his Third Army and General Weyland with the XIX TAC commenced their operation 1 August 1944. Within one month from the day when the Third United States Army and the XIX TAC of the Ninth Air Force began operations together in France, the armored and infantry divisions and covering fighter-bombers of this new air-ground team had broken out of Normandy into Brittany, conquered all of that peninsula except three stubborn ports, firmly secured the line of the Loire, and swept 140 miles beyond liberated Paris to within sixty miles of the German border. It looked like a suicide operation to many. How was it possible for General Patton to keep those invaluable armored units from being cut off?

TAC-Army Cooperation

His answer was found in the close TAC-Army cooperation. Over each armored column was a flight of fighter-bombers in radar contact with the armored column, the tank column commander and the flight commander talking over the situation, the flight commander telling the tank commander what was ahead or on his flank, and destroying it; or the tank commander telling the flight commander of antitank guns invisible from the air that were giving him trouble, and requesting and getting destruction of the same. Amazing radar units known as MEWs or GCIs, in bad weather could position fighter-bombers over targets as accurately as the pilots could themselves in good weather—or could position them over our own carefully camouflaged armored columns, and from there the air-ground team could go to work. Escorted transport planes flew far out into thinly held friendly territory to drop gas and other supplies to keep our armored columns moving. Other fighter-bombers on armed reconnaissance sweeps ranged far to the right of the exposed flank and far ahead of the lead

columns, striking at targets of opportunity, regardless of size, continually keeping the enemy off balance to prevent small units from snowballing together, thereby creating a force potentially able to threaten or impede the movement of the armored columns. Reconnaissance aircraft covered the areas daily, photographing and gaining all information possible on the enemy's dispositions, movements, concentrations, supply points, etc., radioing back information concerning targets of fleeting nature, so as to bring immediate destruction upon them by the armed reconnaissance patrols; or bringing back their photographs which were developed, interpreted and forwarded to the air and ground headquarters, where targets were selected to be hit the following day to insure that no effort be left undone in keeping the armored units moving forward or slowing down their rapid exploitation deep into the enemy territory. This operation furnishes a fine example of how air and ground coordination can be accomplished in assisting the surface forces to carry out their missions.

Conclusions

Tactical air force operations in Europe conclusively proved beyond a shadow of a doubt that the concepts of employing air power, as laid down in Field Manual 100-20 "Command and Employment of Air Power," were true. It was also found that for effective cooperation of air and ground forces, joint participation must begin in the initial planning phase, and continue throughout the entire operation. It is essential that operations be based on plans prepared by both the air and ground elements, that the coordinated air-ground effort should be integrated by planning at that command level which produced the maximum continuing results from the available air-ground forces. It was shown that this coordination can best be obtained at the Tactical Air Command Army level, so far as this concerns air operations conducted in the battle area on an Army Front. For this reason, Army headquarters and the TAC are located as close together as practicable.

To enable our own air force to concentrate on both strategical and tactical targets the *FIRST PRIORITY must be gaining and maintaining air superiority.* Secondly, our air arm must isolate the battlefield to prevent the enemy from moving supplies and reinforcements into the battle area, or from withdrawing or evacuating that area. *SECOND PRIORITY, isolating the battlefield.* Thirdly, the air arm can assist the ground forces in close combat by taking on targets which are beyond the range of, or incapable of being destroyed by our own artillery. This last type of operation to all intents and purposes becomes flying artillery striking in front of our ground forces or ranging one, two, or three hundred miles into enemy territory, seeking targets that the ground forces would have to contend with that the air can easily and readily destroy for them. This, therefore, becomes the *THIRD PRIORITY of a tactical air force.*

We might, therefore, decide that when a land army is brought to bear against another land army, an air arm organized, equipped, and trained for operations against an armed force within, moving into, or withdrawing from, a combat zone, is necessary and vital if the ground forces are going to accomplish their mission rapidly, economically, and with the least loss of life.

Military manpower problems begin in peacetime. They continue through all the stages of preparation for war, through initial to total mobilization, and until the war is ended.

Major General Miller G. White

Operation Julich

From a Photo Intelligence Viewpoint

LIEUTENANT EDWIN HARTRICH, *Army of the United States*

JULICH, an ancient fortress city on the east bank of the Roer river, was the cornerstone of the defense system to protect Cologne. Against this key point the American XIX Corps, after breaking through the Siegfried Line, found its advance into the Rhine plain, blocked along the length of the Roer river.

In their efforts to halt the Americans west of the Rhine, the retreating Germans had blown the control valves of the Roer river dams some thirty miles upstream in the Hurtgen Forest. The 29th Infantry Division reached the west bank of the Roer opposite Julich only to find the swirling flood waters, augmented by the heavy snowfalls of January, had tripled the width of the river barrier. As the Americans hugged the low banks in a preliminary survey, their initial fears of a rough and difficult passage were confirmed in a too-obvious fashion.

With an old moated Vauban-type fortress—the citadel of Julich—as their anchor, the 59th and 363d Infantry Divisions of the German army held the east side of the Roer. That they intended a bitter, last-ditch defense of Julich became apparent from their action of sending reinforcements to a few stubborn pockets of resistance remaining on the American side of the Roer, rather than save and consolidate their resources to hold the east bank.

Since our forces could not make an immediate crossing of the Roer, the enforced stabilization called for new battle plans. However, this was complicated by the lack of information about the enemy and his defenses. At the outset, the flooded river prevented extensive patrolling, while the flat terrain, at least on the American side, provided no prominence from which to observe beyond the first row of houses in Julich. Moreover, information from PWs [Prisoners of War] dropped to a minimum as the enemy happily and wisely chose to keep out of contact. All in all, the intelligence picture as the Americans gained the west bank of the river was a rather faded and uncertain one.

The only remaining course was aerial photos, but even the photo interpreters had their troubles. Bad weather was grounding most of the reconnaissance planes so that despite the "most urgent" requests for aerial cover, new photos were extremely difficult to obtain. Nevertheless an adjoining unit came through with an excellent series of photos of the division front to a depth of eight miles from the river.

Top priority was given by the interpreters to an overall terrain study for the planning and operations officers, to enable them to see the problems that faced them. From this emerged the main elements of the Julich defense picture.

Terrain heavily favored the enemy. What little high ground there was on the banks of the Roer was on the Julich side. To the north and south of the town, protecting its flanks, were low, swampy patches of ground, an effective natural barrier against vehicles and men. On the northeast corner of Julich was the "Zitadelle," a bristling hedgehog defense. From its stone walls the enemy commanded a field of fire over Julich and the river approaches.

The open ground to the flanks of Julich was strengthened with fire trenches and intermediate strongpoints, connecting with the trenches and the defenses along the river bank extending to the north and to the south of the town. However, this picture of the defense system was far from complete, lacking information about the key points to be manned against a final assault. For the Germans resisted the temptation to exploit their positions, many of which were hidden or concealed by the continuing fall of snow.

But this "Hitlervetter," cursed eloquently by the doughboys in their slush-filled fox-

holes, was to pay some dividens to our photo intelligence. Despite rigorous camouflage discipline, the enemy could not conceal the tracks in the snow made by his supply lines. The roads used by his transport to move supplies into the Julich area, the trackage of men and vehicles along the distribution points and dumps could be traced and located from the photos. In this vulnerable spot, strafing and bombing missions, plus artillery fire, helped to hurt the enemy during that period of stabilization.

With the overall report completed, the interpreters placed the division's engineers next on their priority list. Perhaps their's was the most difficult and hazardous operation in the assault on Julich. They had a flooded, swiftly-running river to be bridged right under the muzzles of the enemy's guns enjoying the advantage of high ground on his side of the river. The flood tide made difficult the research for bridging sites, and for the nature of the terrain and the river banks. The Engineers asked PI [Photo Interpreters] to ascertain from their photos the best sites for ponton bridges and the overall widths of the river at various stages, as the waters were imprecceptibly receding from their peak level. They asked for the height and the nature of the banks, for the likely entrances and exits for their bridgeheads, the condition of roads in the enemy territory, the location of minefields and other pertinent data. These demands were largely and satisfactorily met by the photo interpreters.

The mission of the 29th Infantry Division was to spearhead the attack of the XIX Corps across the Roer. It was elementary, even to the Germans, that when the flooded river dropped to its normal level the Americans would attack. To retain the element of surprise, the 29th set its "D-day" to cross the Roer while the river was still high enough to lull the Germans into a sense of temporary security.

There were still many gaps in the picture to be filled in. For example, "Could PI provide routes through the swampy areas on the flanks of Julich? What were the main strongpoints and their probable fields of fire? Where are the defilades and the wood patches to provide cover for the attacking troops?" Although PI was able to give some answers, the enemy by his fire and track discipline continued to safeguard some of the vital information.

Meanwhile in this period of waiting and planning, the Germans with sniper and artillery fire harassed the American side of the Roer. Particularly accurate and effective was this artillery fire in the 116th's regimental zone, evoking the comment that "the Kraut's fire at chow time was more punctual than the chow." Asked to locate the enemy's OP [Observation post], the PI team pinpointed from the photos a long-suspected water tower on the far side of the river. The air force flew a special mission and its bombs obliterated the tower. Thereafter the accuracy and the volume of enemy fire in the 116th's area declined sharply. This was an example of the routine work of the PI team in addition to its specific assignments.

In slowly assembling the complete picture of Julich, it was decided that a reconnaissance in strength should be made: first, as a dress rehearsal for "D-day," and secondly, to force a showdown of the enemy's defenses. A combat patrol of company strength was briefed with the aid of enlarged (1:5000 scale) photos. With these blowups the soldiers were shown exactly what they would encounter: fences and other obstructions; MG positions, shelters and connecting fire trenches; barbed wire, defilades and woods where they could find cover from the enemy; swampy and muddy ground to be avoided as well as cleared fields of fire; the best routes of approach and avenues of escape. With the photos they visualized the area and carried in their mind's eye a much more vivid and realistic picture than obtainable from a map.

The company made the raid, but the individual reports, sometimes confused and contradictory, were supplemented and revised by photo intelligence. Returning to their enlargements, the patrol leaders were able to clarify their findings and more accurately pinpoint the danger spots. A special sortie

was flown immediately after the raid, with both oblique and vertical photos taken. These prints told a story.

Mistaking the raid for a full-scale assault, the Germans had scrambled to man their positions. Morning-after photos with their fresh track patterns gave new meaning to obscure mounds in the snow, to suspicious irregularities and gashes in the terrain and to the enemy's use of high ground. The raid and the photo reconnaissance had combined to disclose the Germans' defensive plan.

Now the final preparations for the assault could proceed to a swift conclusion. The Engineers were able to complete their plans for the river crossing with the aid of the terrain data and river widths supplied by PI. Detailed maps of a 1:3000 scale with all enemy installations annotated were photographically reproduced and distributed to all units, together with photos.

Photo mosaics with defense annotations were distributed, thirty sets to each regiment. Every platoon leader had a mosaic, together with vertical and oblique photos covering his area for intensive pre-action study. And as a final orientation, each platoon leader was flown over Julich in a cub plane, to compare the town and its defenses with the annotated photos in hand. Details which no ordinary map would carry, such as obstacles in rubble-choked streets, were pinpointed on a special town plan prepared by PI for general distribution.

The attack on Julich began at 0245 on 23 February with an intensive artillery barrage provided by nearly 800 guns of all calibers. With as many as thirty-seven shells striking selected targets simultaneously on TOTs [Time of target] almost 3,000 tons of steel literally blew the Germans out of Julich. The heavy casualties and the shock power of this barrage were evident to the advancing infantrymen who captured many Germans still quivering with fright or senseless in their shelters.

Enemy communications had top target priority, followed by CPs [Command Posts] and enemy artillery positions. Infantry-artillery coordination reached a new high. As the infantry advanced the artillery barrage would lift forward to hammer one position after another in front of the doughboys. Both forward observers and fire direction centers were supplied by PI with duplicate sets of photos, bearing numbered box barrage areas. As the 29th's advance passed one phase line after another, the forward OPs could readily and quickly lift the fire forward by consulting their annotated photographs.

On the morning of the 23d the Roer was crossed; by the afternoon of the 24th Julich was cleared of the enemy. So crushing and rapid was the assault that the enemy left the Citadel undefended.

Operation Julich exemplified the truth of the statement made prior to this war by Field Marshal von Brauchitsch who stated, "The Army which has the best photo reconnaissance service will win the next war."

Our own people, including many of our military leaders and our diplomats, do not appreciate at its true value the peculiar instrument of amphibious power. Our navy has been particularly interested in the Pacific ocean, as enemy of the Japanese navy and as friendly rival of the British navy. Our army has measured itself by the German army, until 1942 regarded by professional soldiers as incomparably the best army in the world. Now, there is a disposition to count the number of divisions in the Red army.

As a result, we are just beginning to understand, we have hardly begun to realize, the uses and significance of our own military instrument, that it is a new instrument and in scale and power and its uses unlike any other force in the world.

Walter Lippmann in "N.Y. Herald Tribune"

The Army Public Relations Program

MAJOR JOHAN O. RONNINGEN, *Infantry*
Instructor, Command and Staff College

ON 25 February the newspapers reported that Generalissimo Stalin with one stroke of his pen, unified the Russian armed forces. Could that have been possible in this country? Remember that we have been talking for several months about unification of the armed forces. We must constantly realize in the army that we live in a democracy; that the army belongs to the public; that the public is entitled to know about the army; and also that before we make any major changes in government policy or in the organization of any branch of government such as the army and navy, it must be examined in Congressional committees, debated on the radio and in the press and voted on in Congress.

Public opinion is not a new thing. Ever since people got together in groups, public opinion had made itself felt. In the year 1214 King John of England was forced by public opinion to sign the Magna Carta and give the people more rights. In 1776 public opinion caused the American Revolution. In 1870 public opinion in France forced the French Army into the Franco-Prussian War for which it was not ready.

Favorable public opinion arises only when the people have confidence in the army. When they understand what the army is doing, they will support it. An officer in the Bureau of Public Relations in Washington has put it this way:

"The War Department Bureau feels the public pays for the army, the public is the army; that is, the men in the army come from the public. The public through its Congressional machinery rufis the army; therefore, the public is entitled to know everything about the army. From our rather selfish army viewpoint, if the army is going to operate, it depends upon public opinion to gain appropriations."

Public relations is not difficult in war time. We do not have to exert ourselves very much to climb upon the bandwagon of the great surges of public emotion that run through nations at war. The difficult time to gain favorable public opinion is now when the war is over. It was true after the last war, too. Public prejudices are in full flower during a period of peace. During the peace period following World War I, and it is happening again today, there was gradually uncovered the fact that some of the public still held the idea that the army is an autocratic institution. There are always some who are worried that the army will become the tool of the man on horseback. In addition, today, anyone who has been in the army, can write almost anything he wants to about the army, favorable or unfavorable and get it printed. Following World War I, we had a "smear campaign" against the army, and there are tendencies in that direction again today. There are certain problems uncovered by the war that we could not face during war time that we must now face, and we must look for support to the public if we are to solve those problems: the problem of a unified department of national defense, the problem of compulsory military training or whatever type of training we are going to have, and last but not least, what the role of the army is to be in the United Nations organization and as occupation troops in Germany and Japan.

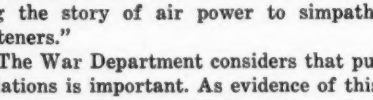
Our job in public relations, then, is a job of education—to educate the people, to acquaint them with the part we played in the war and what we accomplished, as well as to admit our errors. We need credit in the bank of public opinion. We need a favorable public opinion so that when our errors come to light, or when we do anything that tends to create an unfavorable impression, we will have some credit waiting with the public that we can draw on to enlist support of our future program and our present activities.

The army air forces probably had the most successful public relations program during the war. Immediately after the war was over, General Arnold wrote a letter to all of his commanders in this country. He wanted to be

certain that the army air forces continued their aggressive and virile public relations program in the post war period. This is part of what he said: "The future of the Army Air Forces will depend in no small degree upon a sound, well-planned and properly guided public relations program. We are now entering a difficult phase of our existence. This war is over. Patriotic support is turning to close scrutiny and critical analysis of our accomplishment at a time when we no longer have spectacular combat news as a vehicle for telling the story of air power to simpathetic listeners."

The War Department considers that public relations is important. As evidence of this, it has set up a Director of Information, who is a special staff officer to the Chief of Staff.

The Director of Information has under him three agencies: first, the War Department Bureau of Public Relations, whose mission is to interpret the army to the public and the



public to the army; secondly, the Information and Education Division, whose job, is to interpret the army to the army. That is, to tell the soldier what his mission is, and why it is necessary; in addition, to give him educational opportunities so that if he should be separated from the army, he will be able to make a decent living. Thirdly, he has the Legislative and Liaison Division whose job it is to interpret the army to Congress. Constituents write Congressmen endless questions about the army. Congress needs to know the facts about the army to answer the public, just as the army does. The Legislative and Liaison Division provides a statistical service for Congress, and also helps in presenting the army's problems to Congress in Congressional Committees.

Public Relations is so important that the War Department spends the time and money to read, clip and analyze 150 newspapers every day and all the popular magazines and to record remarks of radio speakers and commentators. Weekly digests on the main problems in public relations facing the army are made up from these clippings for the use of public relations officers and personnel throughout the army. They are used in analyzing public opinion to discover what kind of a program in public relations must be planned. These digests include favorable and unfavorable comments. The War Department needs to know what the public is thinking, and this is one means it takes to find out.

The Army Air Forces thought it so important to have a public relations program that some time ago they set up a course in public relations in their special staff school at Orlando, Florida. The War Department has also established the Army Information School at Carlisle Barracks, Pennsylvania.

The titles of the main blocks of subjects taught in the school give some idea of the wide area covered. They include Army Information; Public Relations Program; Information and Education Programs; World Problems; Media of Dissemination; Public Opinion; Field Operations; the United States of America, which includes the meaning of democracy, American Government, American History and our basic military policy; the Returning Soldier; the War Review; Army Education Programs; and Military Psychology and Leadership.

Public relations officers can find the War Department policy of public relations stated in details in the *Policy Book for Public Relations Officers, Radio Guide for Public Relations Officers,* and a little phamphlet *Suggestions for Public Relations Officers,* all published during the war by the Bureau of Public Relations. In addition a weekly bulletin is published by the bureau giving suggestions to public relations officers and amendments to the War Department policy as it is changed from time to time.

Public relations has four functions: it advises, diagnoses, prescribes and operates. Alert public relations keeps its fingers on the public pulse and advises the commander, the staff, and other command agencies on public attitudes and the impact which admin-

istrative decisions will have on the public. When the Army's public position is endangered, it seeks the causes, evolves a plan and engages in programmed publicity toward definite corrective objectives. If the causes cannot be corrected through publicity, it recommends correction at the source. Through its knowledge of public attitudes and Army activities, public relations serves best when public difficulties can be foreseen and avoided.

The biggest public relations problem is the problem of the morale of the overseas troops. In our demobilization plans, we neglected public relations. Now, for a long time we have found ourselves on the defensive. It is true that we planned the point system very carefully. We sampled public opinion; we found out what the soldier thought was a fair way for us to demobilize him. We put that plan into effect, but we more or less stopped there. We did not realize, even though it had happened in World War I, that immediately after the war was over there was a great demand for returning the soldiers. We should have explained to the public, and to the army, why it was necessary that some men stay overseas longer than others.

In this case, the public was not properly told the facts. They did not know all the facts about the amount of transportation available, about the surplus equipment which they want disposed of profitably, or about the role of occupation troops. They did not comprehend our transportation bottlenecks. Public opinion forced us to demobilize faster than we had planned until today we have demobilized 7,000,000 men (2,000,000 more than we had planned to demobilize by this time).

With the army demobilizing faster than planned, plans for other activities also failed. The speed-up in demobilization snowballed and raised one problem after another to the point where we finally had to put a break on demobilization and slow it down. And then another big outcry went up. This, coupled with the mistakes we made during the war that are beginning to come out in the press, as is only natural, combine to give us what is on the whole an unfavorable public.

Two methods can be used to gain a favorable public opinion: a positive method and a defensive method. In demobilization, we were on the defensive. It is true we read in our newspapers that men who were professional agitators in civilian life were behind the overseas demonstrations. But no one could have instigated these demonstrations if the ground had not been ripe for them.

When General Spaatz was forming the Eighth Air Force in Britain in July 1942, he was a busy man, as were all of his staff. They gave no time to public relations. They were training their combat crews, and preparing future operations. But one day one of his staff officers came to General Spaatz and said: "General, I think we are getting out on the limb on public relations. If we do not watch our step, we are, in the near future going to get an unfavorable press. That will strike a blow against the morale of our troops and we are going to lose a lot of public support that we are going to need." General Spaatz saw that it was time to set up a definite and planned public relations program. So he wrote a statement which he showed to General Eisenhower and obtained his approval. General Spaatz said:

"This statement is off-the-record . . .

"I want to talk with you about your relationship with the Eighth Air Force . . .

"I shall lay my cards on the table and tell you, frankly, that there is no justifiable reason why you have not been given more professional cooperation and personal consideration. The simple truth is this: I, and all the men under my command, have been so busy getting started, and so eager to pull off our first few operations, that we have been thinking of aircraft and guns and armament and not the press. This is the truth and the whole truth . . .

"All right—we are through with the past. What of the future?

"Well, in the future any accredited correspondent will be permitted to make visits to American stations. You will be best served by having the Public Relations Officer of the Eighth Air Force make the arrangements and secure the approval of the Commanding Of-

ficer of the station to be visited. Occasionally that Commanding Officer will say no, but I pledge you it will not be often, and then only for the very best reason . . ."

After that time, the Eighth Air Force received probably twice as much publicity as any other similar organization. either army or navy, and a very favorable public opinion.

General Eisenhower, as Supreme Commander in the European Theater, told the press: "I do not care how much you criticize me. No criticism of me will be censored by any of my staff." The result was that General Eisenhower and his headquarters were almost completely free from press criticism during the war.

Public relations is like war. We have to strike the first blow. We can not sit on bad news. If we try to hold a secret, it will be blasted as a scandal on the front pages of the newspapers, but if we make a frank admission of our errors, chances are that we will find this news buried in the want-ads. The code of the press is to print the facts. We have helped fight a war one of whose purposes was to uphold that code. When information is of no value to the enemy, it becomes public property. And if we tell it to the press instead of waiting for them to find it out, we will not be forced into a defensive position and harassed by an unfavorable public opinion.

The Public Relations Officer is now a special staff officer in any echelon of command. Before the war and at the beginning of the war he was the intelligence officer part of the time. The intelligence officer, however, dealing mainly with classified information, whose job it is to keep it from the public, is the antithesis of the public relations officer, whose job is to give out information to the public. We discovered during this war that the public relations officer must be a special staff officer, and that his job cannot be handled by the intelligence officer.

The public relations officer:

1. Advise the commander, the staff, and other command agencies concerning relations between the command and the press and other segments of the public, including the civilian communities adjacent to command installations and relations with civilian groups.

2. Plans and carries out the public relations program for the command.

3. Coordinates, processes, and releases information of public interest concerning the command, including photographs and motion pictures, both directly and to newsgathering agencies and other information media.

4. Observes and analyzes trends in public opinion from all available sources.

5. Reviews for security and propriety in accordance with War Department policies material originating with military personnel within the command and intended for dissemination to the public.

6. Exercises supervision over all matters relating to correspondents representing news and information media. Under certain circumstances he also arranges and provides facilities for messing, housing, transportation and, in the absence of commercial facilities, provides means of communication by which press dispatches may be transmitted.

A public relations officer must be honest, patient, and sympathetic. He must inspire confidence in the press and be able to tell them when they cannot print some information, in a way that they will understand why they cannot print this information. He must know how to handle the press; the philosophy of the press, and what their requirements are. In the case of news releases, he must know how to write them up so the press can best use them. He must also know the place of pictures and the radio in his program for telling the army's story. In other words, he must know all the mechanics of these informational media. His is a big job.

The 40-mm in Direct Support of the Infantry

LIEUTENANT COLONEL LEE J. DAVIS, *Coast Artillery Corps*

WHEN the Americal Division invaded Cebu on 26 March 1945, it encountered the strongest defensive positions found anywhere in the Eighth Army's Visayan campaign. In the first stage of the operation, infantrymen of the 132d and 182d Infantry Regiments crossed the heavily-mined beaches near Talisay and advanced rapidly northward, capturing Cebu City, five miles from the beachhead, on E+1, but thereafter the complexion of the battle changed as the main body of Japanese troops retired from the narrow coastal plain to prepared positions in the hills north and west of the city.

These fortifications had been under construction for many months, were elaborately prepared, and held a six-months' supply of food as well as huge quantities of weapons and ammunition. There were literally hundreds of well constructed pillboxes, fire trenches, and tunnels, used both for storage and protection of personnel.

In most instances, and particularly along the main line of resistance on and near Babag Ridge, the tunnels and several entrances and exits, with openings on both sides of the ridge, and with excellent fields of fire, made almost all the hills mutually-supporting. These tunnels appeared at intervals of a few hundred feet on both sides of the ridge for a distance of several miles, and all had only one route of approach. This was the Lahug Road, a narrow coral path cut out of the precipitous slope of the hills. It was at the Cebu City end of the road that one American company was virtually wiped out when a tank, firing point-blank into a cave, exploded an ammunition cache hidden within a hill up which the doughboys were advancing. The enemy armament consisted of

40-mm gun.

150-mm naval guns sited so that fire could be brought to bear on any target in Cebu City, the excellent Cebu harbor, and Mactan Island, the location of our operational air strip. Lighter weapons included 75-mm guns, three-inch naval guns, 40-mm, 25-mm, and 20-mm guns, .50 caliber light machine guns, and 90-mm mortars. An interesting sidelight on Japanese ammunition was the use of .50 caliber high explosive fused with supersensitive and base-detonator (impact) fuses. These were used primarily against personnel, and a high percentage of serious casualties resulted.

As the Americal Division probed deeper into the Japanese defenses, it suffered an increasing rate of casualties, and the daily advances were measured in terms of yards. Virtually every known infantry weapon was brought into action, and aircraft and artillery kept up an incessant pounding of enemy positions. Nevertheless, the attack continued to proceed slowly and at heavy cost. Many of the Jap strongpoints were invulnerable to anything but direct bomb or shell hits, and as a result, the task of burning and blasting the enemy out of the way with flamethrowers, satchel explosives, and bangalore torpedoes was both slow and expensive.

It was at this juncture that the division commander called a conference to determine a practicable new or additional method of attack. In attendance were the G-3, the assistant G-3, the commanding officer of the 746th Antiaircraft Gun Battalion, and the commanding officer of the 478th Antiaircraft Automatic Weapons Battalion.

The problem, essentially, was this: air and artillery support had been given, but neither bombs nor large caliber shells had the property of penetrating directly into the caves and tunnels. Self-propelled M-7 howitzers and M-4 tanks had also been used in support, but these were too few in number to cover the entire front effectively, and they were frequently needed for longer range missions.

It was therefore recommended that the 40-mm guns of the 478th Automatic Weapons Battalion be thrown into the action. Although less mobile than the self-propelled howitzers, they could be drawn to almost any point along the front. Added factors favoring their use were their high rate of fire and the fact that plenty of 40-mm ammunition was available.

The guns could be spared. Enemy air attack had been absent, and four gun sections originally scheduled for the defense of the Lahug Airstrip, which was not yet operational, were available. While waiting, these had been used to give a defense in depth of the harbor and dump areas.

Both the Americal Division Commander and the Division Artillery Commander approved the experimental use of the 40's, and on the morning of 8 April two gun sections, less M-5's were moved up under cover of darkness. These were emplaced 1,000 yards west of the capital buildings, on a hill overlooking a draw and in a position to bring fire at an average range of 1,500 yards on a series of hills immediately to the front. One of these, known as Hill 21, was the immediate objective of two companies of the 182d Infantry.

Hasty fortifications were thrown up to give some degree of protection against return fire. Unfortunately the narrow knoll was the only point from which effective fire could be placed on the objectives, and as a result, the gun sections were emplaced only 20 yards apart—much too close for safety within range of enemy artillery and mortar fire.

The gun site could be reached by truck, and fire control equipment was taken along in order to permit firing by Case III pointing. This method proved to be accurate and effective, but was abandoned when it was found that the M7A1 sight could be used with the same effect and with the employment of smaller gun crews. The M7A1 sight was used to bring effective fire on pin-point targets at ranges up to 2,500 yards, using a speed setting of OMPH and pointing the arrow directly toward the target.

In the initial phase of the assault on Hill 21, this fire proved to be exceedingly effec-

tive against pillboxes, tunnels, and trench systems, and the attacking companies jumped off with light casualties. During the first day no accurate return fire was placed on our positions, although one gun crewman was picked off by a sniper, and the M-7 units, also in support were harrassed by mortar fire.

The 182d Infantry Regimental Commander was enthusiastic when he received reports from his battalion and company commanders. They had found that, because of the small radius of the 40's burst and its almost complete lack of dispersion, the infantry could advance to within a few yards of its objective before it was necessary to lift its supporting artillery fire.

The Japs were apparently well impressed, for the following morning, as the crews were beginning to give enemy emplacements a going over, they shifted their mortar fire from the M-7's to the 40's. One section was bracketed and forced to withdraw. Knowing that the fire was needed, the battery commander called for two volunteers to help him man the gun, and with his first sergeant and a staff sergeant for a gun crew, he fired 168 rounds of ammunition and materially aided the advance.

After the first few hours' successes at Hill 21, the commanding officer of the 478th Automatic Weapons Battalion received instructions to reconnoiter the entire battle front and determine other areas where the 40's could be used effectively. On the basis of this investigation, it was decided to divert two guns to the south flank to support the advance of the 82d Division of the Philippine Army.

The Filipinos were at that time encountering heavy resistance in the hills just west of Basak. All of the Americal's division artillery was being employed against the main body of the enemy farther north, and the Filipino assault on Antangua Hill was faltering. Because of the roadless, precipitous hills, tanks were unable to move far enough forward to lend effective support.

The problem of moving the 40's into position was solved by the Engineers of the 57th Combat Battalion, who braved land mines, snipers, and mortar fire to carve a road through to the firing positions. Two gun sections were dragged into position up a 44° gradient by D-7 tractors, and supported the action in the Buhisan Reservoir area for two weeks.

Ranges fired from 8 April to 22 April, the period of the most intense activity, varied from 500 to 4,000 yards, and some effective fire was obtained at a range as great as 4,500 yards. During an afternoon covering mission one section scored a direct hit on an ammunition dump at 4,000 yards, and observers could see smoke rising for more than an hour.

In a two-week period the 40's destroyed one CP, three OP's, four supply dumps, and ten huts; blocked seven tunnels; knocked out three mortars and two automatic rifles; reduced seventeen dugouts, seventy-seven pillboxes, and seven trench systems; silenced twenty-nine machine guns; and inflicted an undetermined number of casualties on the enemy. This was accomplished with an expenditure of 11,895 rounds of high explosives and 625 rounds of armor-piercing ammunition.

Although the 40-mm proved itself invaluable in the support of infantry advances during the critical phase of the Cebu campaign, its ability to reduce enemy positions should not be overestimated. On Cebu the decisive factor, as it is in all campaigns, was the infantryman moving in to dig out the enemy at close quarters. It should be remembered that at Hill 21, Americal Division troops suffered very heavy casualties, despite the excellent artillery preparation.

Some valuable lessons were learned during the Cebu operation. Among them are these:

It was found neither necessary nor desirable for the firing batteries to send out their own forward observers. In most cases corrections were made from the gun position. Battery Commander's telescopes were used for spotting when Case III pointing was employed, and either field glasses or a borrowed twenty-power scope when on-carriage sights were used.

Forward observation was furnished by the infantry when communications facilities were available, and some very accurate firing was based on observers' information. At times corrections were given in increments as small as five yards at a range of 2,000 (2½ mils), which is a fine adjustment in any artilleryman's book. In one phase of the advance on Hill 8, the infantry called for harassing fire only fifty yards to its front.

Cover and concealment are of vital importance, and if possible some overhead cover should be provided. At all times in this type of firing a minimum crew should be used, and all non-essential observers, who experience has shown, are likely to congregate when a new type of fire is being employed, should be kept away from the gun positions. It was found that the Japs tended to shift their harassing fire from the M-7's to the 40's, and one gun section was decimated by a mortar shell that burst in the trees and sprayed fragments on the crew. All the men were in foxholes at the time, but the downward burst caught them. Only one man was killed—and he by fragments which struck his head after his helmet had fallen off in his dive for a foxhole.

Maximum protection should be given the guns at night. The Japs made a habit of attempting to infiltrate in any area where artillery pieces are known to be located, and one such band on Cebu penetrated the Filipino lines and put a 40-mm gun out of action with demolition charges.

When firing from the wheels on a hit-and-run mission some stability is necessary. On Cebu this was obtained by using the outrigger jack pads on whatever was available—sand bags, wooden ammunition boxes, etc. On some missions the gun was fired while coupled to the prime mover and was moved before the enemy could range in on it.

Tubes were inspected after the completion of two weeks' firing, and it was found that eight out of fourteen were well worn. During the course of the firing the only malfunctioning part was a broken outer cocking lever. This was replaced at the position. The gun had fired 3,650 rounds up to that time.

Near the end of the operation a wounded Japanese prisoner of war, taken near a gun position by men of Battery B, paid tribute to the men and guns of the 478th Antiaircraft Artillery Battalion. "Guns that go boom-boom," he said, "have killed many Japanese." The prisoner of war had been hit by fragments from a 40-mm HE shell.

We never had comparable unified direction or command in Washington. And even in the field, our unity of operations was greatly impaired by the differences in training, in doctrine, in communication systems, and in supply and distribution systems, that stemmed from the division of leadership in Washington.

It is true, we were able to win in spite of these handicaps. But it is now time to take stock, to discard obsolete organizational forms and to provide for the future the soundest, the most effective and the most economical kind of structure for our armed forces of which the most powerful nation is capable.

* * * * *

Among the things that have encouraged aggression and the spread of war in the past have been the unwillingness of the United States realistically to face this fact, and her refusal to fortify her aims of peace before the forces of aggression could gather in strength.

President Harry S. Truman

Limited Assignment Men Serve in Forward Areas

LIEUTENANT COLONEL FORREST J. AGEE, ***Adjutant General's Department***
Personnel Procedures Officer, Replacement Training Command, Middle Pacific

THE Pacific War embraced half the world as its battlefield, and the numbers of men needed to wage and win it were proportionately great. Consequently, the Army had to be alert to adjust personnel placement policy wherever experience indicated that a saving or more efficient use of manpower was possible.

One of the most prevalent misconceptions has been the theory that only men without any physical defect whatsoever could serve in a combat zone. This has been proved to be without basis. Because of it no soldier was considered eligible for such duty unless he had top ratings in each of the six digits of his Physical Profile Serial[1] number. The "perfect" general assignment soldier, as now represented on the Physical Profile Serial, would be rated 111111 in PULHES.[2] He would be a commando type, the very cream of the assault forces.

Battle, of course, has an undeniable tendency to lower the points in the Profile. Malaria, asthma, hay fever, or any organic disorder might reduce the "P" factor from 1 to 3. A stray shell fragment can make a 3 of the "U" item; flat feet, a leg injury, or trench foot may lower the "L" factor. The "H" or hearing qualification may be affected by excessive concussion, and the "E" factor gravely affected by the loss of an eye in battle or by the lessening of normal vision after overmuch strain. Finally, perpetual danger, the "close calls" of combat, battle fatigue, and continual nervous tensions may readily induce psychoneurosis and affect the "S" factor of the Profile.

But—men with lowered physical rating were used in areas far forward. This is only logical. A man whose general physical condition is less than perfect can nevertheless perform as well in close support of combat units as he might in the States. A cook, clerk, or truck driver may have an injured hand, arm, or shoulder and still serve effectively, and there are many jobs that do not require prolonged standing for a soldier with weakened lower extremities. A partially deaf man may be a duty soldier (590), typist, mess assistant, or truck driver. Work as a warehouseman, orderly, cook, or KP will not tax the capabilities of a soldier with weak eyes. Further, psychoneurotics are often returned, as a form of therapy, to the conditions that caused their abnormality. Army psychiatrists have found that these men profit by work in combat areas. A minor physical deficiency need not prevent the full-time and efficient performance of a job, if the demands of that job are such as neutralize the physical limitation.

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[1] War Department Memorandum No. W 40-44, 18 May 44, states: "The Physical Profile Serial System is based primarily upon the function of various organs, systems, and integral parts of the body. Since the analysis of the individual's physical and mental status plays an important role in his future assignment and welfare, not only must the functional grading be executed with great care but also clear and accurate descriptions of his physical and mental conditions are essential. In developing the system, the human functions have been considered in six categories. For ease in accomplishing and applying the profile system, those categories have been designated P [Physical capacity or stamina], U [upper extremities], [L lower extremities], H [hearing, ears], E [vision, eyes], and [S neuropsychiatric]. The factors to be considered, the parts affected, and the bodily function involved in each of these categories are as follows:

"There are four grades in each of the six categories. For ease of application and to assure uniformity of recording, the first two grades are considered to represent a high level of physical fitness. Mobilization Regulations 1-9 may be used as a guide in considering certain defects. For this purpose the first two grades may be considered as representing the general military service category. Grade three generally represents individuals with physical defects which, due to impairment of function, prevent the individual from being classified for general military service but are considered acceptable under induction standards for limited service. Grade four represents defects that are below the minimum physical standards for induction."

[2] In connection with the use of the profile serial, the letters PULHES are not written above the profile serial number when it is entered on a soldier's record; only the six digits representing his rating in each category are entered, in this case 111111, which shows the highest rating in each of the six categories and is an A profile. Should Private John Jones have a profile serial number 211211 (physical stamina-2, upper extremities-1, lower extremities-1, hearing-2, vision-1, neuropsychiatric-1), he would have the minimum rating for an A profile according to the qualifications stated in the preceding paragraphs. Private William Smith, on the other hand with a profile serial 322231 (physical stamina-3, upper extremities-2, lower extremities-2, hearing-2, vision-3, neuropsychiatric-1), would have the minimum rating for a B profile.

The practical validity of these facts has been demonstrated in action beyond the possibility of cavil. Tenth Army, while fighting its share of the bloody battle of Okinawa, found itself faced with the necessity for utilizing several hundred limited assignment men. These soldiers, injured in battle but recovered and ready for duty commensurate with their limitations, were in the 74th Replacement Battalion awaiting assignment. No qualified assignment agency was immediately available to accomplish the mission of finding jobs for these men, and time was at a premium. Accordingly, a request for an Audit Team was made. Qualified specialists were immediately rushed to Okinawa by plane, and began its work on 3 June 1945.

The plan established then involved a check by the team of each of these Service Force installations. Determination was to be made of the jobs within each unit that could be performed by limited assignment personnel. If a combat-fit man was found performing such a job, the Audit Team was authorized to effect an exchange of this man for a limited assignment soldier qualified to perform the duties required. The combat-fit man was to be given combat-training by Tenth Army for eventual active assignment.

Signal Corps, Engineer, Quartermaster, Military Police, and Ordnance organizations were audited by the team. Because of the highly technical mission and specialized personnel encountered in some units within these services, there were organizations from which few men were recommended for exchange. Factors involving organizational efficiency always received full consideration. On the other hand, jobs were found within many units which could be readily vacated by the combat-fit to provide openings for limited assignment personnel. Organizations where a high degree of technical specialization most frequently precluded adjustment of personnel included Engineering Heavy Construction Battalions, Ordnance Maintenance Companies, and some Signal Corps units. However, jobs for many limited assignment replacements were found in Ordnance Ammunition Companies, Quartermaster Dump Truck Companies, and Military Police Battalions.

In twelve days of auditing, the team located 2,077 vacancies to be created in the service units by assignment of appropriate personnel to combat duty. These jobs were, accordingly, available to the limited duty personnel awaiting assignment at the 74th Replacement Battalion, and proved more than sufficient to meet the original requirement.

The factors and considerations involved in an audit mission in combat zones were found to vary somewhat from those in rear echelon auditing. Cooks in rear echelons, for example, may be conveniently replaced by limited assignment cooks, since training facilities are available and adequate. However, this ease in training does not prevail under combat conditions; moreover, a satisfactory mess is a potent morale factor for men actively engaged in battle. Therefore, few kitchens on Okinawa were disturbed. The same was true of clerical sections. Those MOS's [Military Occupational Specialty] most frequently used for assignment of limited duty [3] personnel on Okinawa were: Carpenter (050); Duty Soldier (188) and (590); Truck Driver, Light (345); Basic (521); and Military Policeman (677).

The cardinal principle for assignment to forward areas remains as always—*to use soldiers in the most active task of which they are capable.* Conditioned by that consideration, the utmost possible advantage must be taken of special skills and training. "The right man in the right job," builds a victorious army.

[3] "The Physical Profile—An Element in Classification" prepared by Personnel Division, G-1, War Department. The *Military Review*, June 1945, pp 62-65, states: "...To be rated as Profile A, a man must be at least grade two in general stamina and hearing and grade one in the four other items. To be rated as profile B, a man must fall below profile A and must be at least grade three in stamina and vision, and at least grade two in the rest except emotional stability where he must rate one. To be rated as profile C, he must fall below profile B, but must be rated at least two in hearing, grade one in emotional stability and grade three in the rest.
"...Below physical profile C is the man who would not be inducted into the service, but if he falls below profile C while in the service he may be retained if he has been trained in and is performing adequately in his current assignment."

Okinawa

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THE movement of the war through the Central Pacific towards the Japanese Empire called for the conquest of Okinawa only forty days after the initial landings were made on Iwo Jima.

This called for the closest coordination in shipping as well as air and naval support. It is true the troops which were to be employed on Okinawa were other than those of the Iwo Jima assault forces, but a considerable part of the naval task forces were engaged in both operations.

This close schedule required the planning to be concurrent with that for Iwo Jima. More shipping was available in the Pacific than ever before, which somewhat eased the pressure. However, the wide dispersion of both troops and shipping made planning a difficult and complex procedure. Troops were to be embarked from the West Coast, the Hawaiian Area, the Philippine Islands, and the South Pacific. This force, when assembled, totaled over 1,400 ships of all types and a great number of troops.

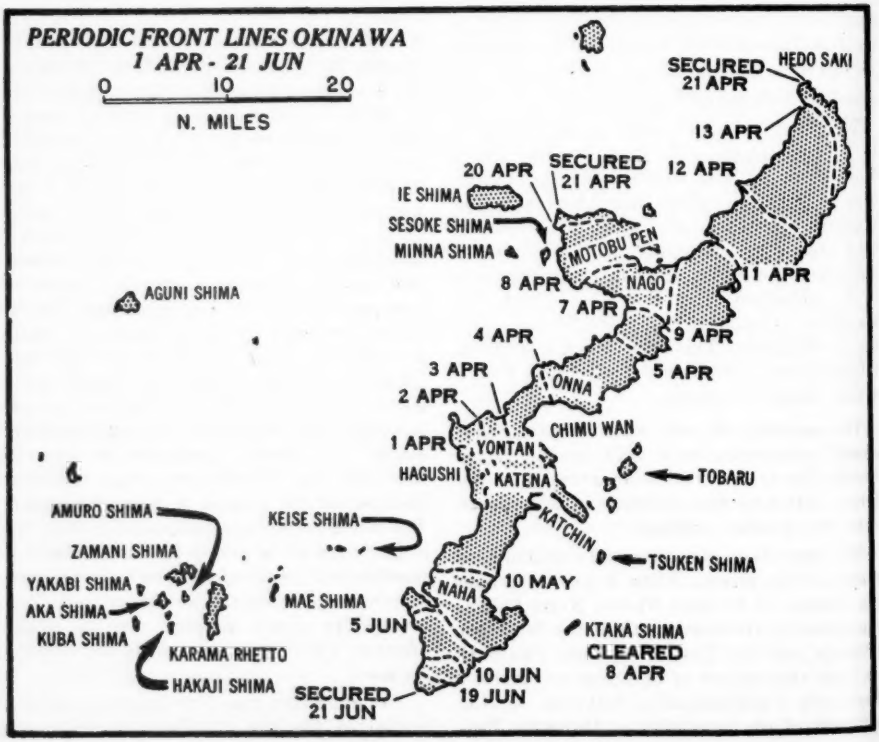
The assembly of units was ultimately completed, rehearsals were held in the South Pacific, Leyte and Hawaiian areas, and the forces sailed to the objective in accordance with the detailed schedule.

The operation was originally planned to comprise two phases. Phase I was to include the capture of Karama Rhetto, Keise Shima, the island of Okinawa south of the Ishikawa Isthmus and the Eastern Islands. Phase II included the capture of Ie Shima and Motobu Peninsula simultaneously, followed by the conquest of the remainder of Okinawa. Provisions were made so that Ie Shima might be included in Phase I if the tactical situation so dictated.

The Tenth Army (reinforced) in conjunction with naval attack forces, was charged with the mission of attacking, occupying, and defending one or more positions in the Hansei Shoto area. The Army operation plan called for the seizure of Karama Rhetto on 26 March 1945 to be followed by the assault on Okinawa 1 April 1945 with two corps abreast, each corps with two divisions in the assault, one Marine Division afloat in Army reserve and one Infantry Division embarked and held at Ulithi in Area reserve. The general plan placed the XXIV Corps with the 7th and 96th Infantry Divisions on the right, the III Phib (Amphibious) Corps with the 1st and 6th Marine Divisions on the left, in the assault, the 2d Marine Division in Army reserve and the 27th Infantry Division in Area reserve. Each assault division was to land two Regimental Combat Teams (RCT's) in line. Upon landing, the two corps were to drive eastward across the island. The XXIV Corps, upon reaching the east coast, was to pivot on its right flank to seize a general east-west line from Kuba Saki in order to prevent the movement of enemy reinforcements from the south. The division on the right of the III Phib Corps was to drive to the east coast while the left flank division turned to the north to seize the Ishikawa Isthmus in order to prevent the movement of enemy reinforcements from Motobu Peninsula or from the northern part of Okinawa, thus effectively blocking off the central portion of Okinawa. The initial objectives, designated in the Army order, were to be seized as expeditiously as possible and the divisions were to be prepared to continue the attack on Army and Corps order. The Army Reserve was to remain afloat at Ulithi awaiting call as the situation dictated.

Two RCT's of the 77th Infantry Division landed on the five principal islands in the

Karama Rhetto group on 26 March. By 1200, both Hakaji and Yakabi Shima were secured. The troops encountered only light opposition. Subsequent landings were made on three other islands in this group on 27 March, and by 1800 of that date, both Kuba and Amuro Shima had been secured. During the night of 27-28 March, the troops on Aka and Zamani Shima repulsed several minor enemy counterattacks, which were supported by small arms, machine-gun and mortar fire. At 281400, the Commanding General, 77th Infantry Division, announced all organized resistance had ceased in Karama Rhetto but that some scattered enemy groups on Tokashika and Zamani remained to be mopped up. The 77th Infantry Division, less one battalion patroling Tokashika and the garrison force of one reinforced battalion on Zamani, were re-embarked by 291600. A reconnaissance of Mae Shima was made the night of 29-30 March by the FMF (Fleet Marine Force) Amphibious Reconnaissance Battalion. No enemy personnel or installations were encountered. Daily patrols covered the islands of Karama Rhetto clearing up isolated enemy personnel, and at 301000, the Commanding General of the 77th Infantry Division announced all islands in Karama Rhetto had been secured. The battalion which had been patroling Tokashika was re-embarked on 31 March leaving BLT (Battalion Landing Team) 2/305 (reinforced) as the garrison force on Zamani Shima. BLT 2/306 supported by naval and air forces landed on Keise Shima on 31 March meeting no opposition, and by 1015 had secured the island. The 420th Field Artillery Group was landed



immediately on Keise Shima for the support of the main landings to be made on Okinawa 1 April. Enemy casualties for the capture of Karama Rhetto were 514 dead and 119 prisoners of war. Our casualties were 81 killed in action, 88 wounded in action, and one missing in action. The principal items of enemy equipment captured or destroyed were 390 suicide boats.

The Tenth Army landed on Okinawa at 0830, 1 April, over the Hagushi beaches with two corps abreast, the XXIV Corps on the right (south) and the III Phib Corps on the left (north). The assault divisions from right to left were the 96th Infantry Division, the 7th Infantry Division, the 1st Marine Division, and the 6th Marine Division. Troops, supplies, and equipment were landed from LSTs, LSMs, and LSDs using LVTs, DUKWs, and small boats. Weather and sea conditions were ideal for the landing.

The landing was made against light opposition. Sporadic mortar and artillery fire fell on the beaches, causing no damage and few casualties. The troops, pushing rapidly to the east, met a few enemy troops of defenses and by 1230 had captured both Yontan and Katena airfields. The absence of enemy resistance was attributed to the effect of the excellent air and naval support and the withdrawal of the major elements of the enemy garrison to the southern part of Okinawa. By 1800, the Tenth Army, with approximately 50,000 troops ashore, had secured a beachhead of 3,000 to 5,000 yards inland. Eight Regimental Combat Teams, three Artillery Battalions and approximately 15,000 service troops had been landed.

Both corps pushed the attack vigorously on 2 April taking advantage of the light resistance. The 7th Infantry Division on the right flank pivoted to the south, reached the town of Tobaru on the east coast, and by 1600 had severed the enemy's north and south line of communications. The III Phib Corps pushed forward rapidly and reached the line on the greater part of its front on 2 April that it was expected to secure on 6 April. The high ground inland from the beachhead was occupied by our troops and their positions ashore were firmly secured. On 4 April the III Phib Corps completed Phase I in their zone of action. The XXIV Corps met increasing resistance in the south while to the north the III Phib Corps, adopting "reconnaissance in force" tactics, met only scattered groups of enemy.

As the attack progressed from day to day, it was evident the enemy had withdrawn their forces to the south of the east-west line from Kuba Saki. The terrain immediately south of this line was admirably suited for defensive and delaying action tactics. The defenses consisted of blockhouses, pillboxes, extensive minefields protected by double-apron barbed wire, caves and minefields. The enemy artillery was used unstintingly and their defensive tactics were described as "artful and fantastic."

By 9 April the reaction of the enemy to the occupation of Okinawa was evidenced by day and night air attacks, assaults by suicide boats and swimmers, and accelerated activity on the XXIV Corps front.

The progress of the III Phib Corps was limited only by the lack of transportation and the limitation of physical endurance. The tactics of this corps were those of "pursuit and elimination." Scattered groups of enemy were encountered and destroyed with but little delay in the advance. On 10 April, approximately one-half of Motobu Peninsula and the major portion of northern Okinawa had been cleared of enemy resistance and was in our hands. One strong center of resistance was encountered on Motobu Peninsula, which was reduced with some difficulty. On 21 April the Commanding General of the III Phib Corps reported that all organized resistance had ceased on Motobu Peninsula and northern Okinawa, but that considerable patroling would be required to mop up enemy remnants.

With the successes on Okinawa far ahead of the planned operation it was determined to occupy the island of Ie Shima on 16 April as a part of Phase I. Naval bombardment and air strikes in support of the landing commenced on 14 April. Following reconnaissance

of the beaches by the Underwater Demolition Team, three field artillery battalions of the 77th Infantry Division were landed on Minna Shima 15 April, against no enemy resistance, to support the Ie Shima assault. At 0900, 16 April, the 77th Infantry Division, supported by aerial bombardment, naval gunfire and artillery previously emplaced on Minna Shima, landed on Ie Shima with two RCT's abreast against light enemy action. Troops moved inland rapidly and by 1800 the airfield and approximately two-thirds of the island were secured. Troops moving to the east encountered intense enemy resistance centered around Ie Town and Iegusuku Yama. RCT 307, less one battalion, was landed at 1130, 17 April, to reinforce the assault troops. Some mines were encountered on the beaches and the entire inland area surrounding the airfield and the field itself was heavily mined with all types of mines and 300-pound bombs. Intense fighting continued both day and night and on 20 April the pinnacle (Iegusuku Yama) was completely encircled. An all-out assault was made the following morning and at 1035, 21 April, the island was announced secured with considerable mopping up yet to be completed. Following the capture of this island, troops of the 77th Infantry Division were re-embarked for movement to Okinawa. The capture of Ie Shima and the announcement by the Commanding General, III Phib Corps, that all organized resistance had ceased on Motobu Peninsula and the northern sector of Okinawa, ended Phase II of the operation ahead of the planned operations.

A night reconnaissance of the Eastern Islands by the FMF Reconnaissance Battalion disclosed that only Tsuken Shima was garrisoned by enemy troops. BLT 3/105, 27th Infantry Division, landed on this island at 0840, 10 April and by 1635 had overcome all resistance. Seven enemy troops were killed and one man from the assault troops was wounded.

Enemy resistance on the XXIV Corps front had steadily increased in intensity from 10 to 18 April during which time the corps made limited advances against the strongly defended line. On 14 April the troops were ordered to consolidate their positions while continuing to press the enemy, reorganize, build up an adequate level of supplies and prepare for an all-out attack on 19 April. Heavy air strikes and artillery and naval gunfire bombardments continued to hit the enemy defenses both day and night. Many enemy installations were destroyed and the troop assaults compressed the outposts of this, the first, enemy defensive position.

Following the conquest of the Eastern Islands on 10 April, the 27th Infantry Division was landed over the Hagushi beaches and on 17 April, one RCT of the 27th Infantry Division entered the line on the corps right flank. The assault on 19 April was successful in capturing the strongly defended high ground on the corps immediate front, all troops having made advances from 800 to 1,000 yards. Casualties were comparatively heavy with an approximate total of 18,000 in the Tenth Army including 6,000 non-battle casualties. These casualties, the bulk of which had been sustained in the XXIV Corps, reduced the combat efficiency, and reorganization of lines was necessary.

At 1025, 21 April the American flag was raised on Ie Shima after all organized resistance had been overcome. A total of 3,326 enemy had been killed, 252 captured, and 982 civilians interned by the 77th Infantry Division. On 22 April the FMF Amphibious Reconnaissance Battalion landed on Sesoke Shima at 1200 and, by the end of the day, had secured the island, meeting no resistance.

The XXIV Corps from 19 April to 2 May continued to make strong daily attacks against the enemy positions and in turn were subjected to many counterattacks. Some terrain changed hands several times during this period as the battle waxed furiously. Casualties were heavy in both forces, many enemy positions were destroyed, and moderate gains were registered, but the enemy defenses were not materially weakened. At 1145 on 24 April the 1st Marine Division was placed in Tenth Army reserve with one RCT prepared to move to and enter the southern line on twelve

hours' notice. Front lines of the XXIV Corps were reorganized and a coordinated attack was launched on 26 April against the enemy generally along the line: Kashukai—Onaga—Kochi—Hill 196—Machinato Airfield. This attack failed to register any material gains, although local advances up to 1,000 yards were made in the center of the corps front. The 96th Infantry Division, weakened by front-line casualties, particularly heavy in the rifle companies, was relieved by the 77th Infantry Division in the center of the corps front on 30 April.

The 1st Marine Division, released from Tenth Army reserve, was placed under XXIV Corps control and commenced the relief of the 27th Infantry Division on 30 April. On 1 May the Commanding General of the 1st Marine Division assumed control of the front previously held by the 27th Infantry Division.

The divisions on the XXIV Corps front from right to left on this date were the 1st Marine Division, 77th Infantry Division, and the 7th Infantry Division. The Tenth Army, strengthened by the two comparatively fresh divisions (1st Marine Division and 77th Infantry Division), made a coordinated attack on 2 May. This attack was held to limited gains by desperate enemy resistance from the caves and pillboxes, which was supported by heavy enemy artillery, mortar and small-arms fire.

During the night of 3-4 May, the enemy launched well-coordinated air, ground, and sea attacks against the Tenth Army front. Counterattacks against both flanks of the 1st Marine Division on the right (east) flank were immediately followed by an amphibious landing by an estimated enemy battalion in rear of the 1st Marine Division lines. These landings were made simultaneously with a heavy air attack on shipping in the Okinawa anchorages. Several enemy barges were sunk by gunfire while others were successful in landing. Three hundred and fifty enemy were killed during the landing and the others were mopped up in the rear areas the following day. On 4 May the XXIV Corps repulsed several strong counterattacks, which resulted in over 3,000 enemy killed during the night and day attacks.

Daily attacks were continued all along the front, securing dominating terrain and destroying enemy positions; but little advance was made during the period 2 May to 10 May, at which time another strong attack was launched by the Tenth Army with corps abreast. The 6th Marine Division entered the line on the right of the 1st Marine Division on 8 May, when the front was reorganized into a two-corps front.

Daily progress of the troops was most difficult from 12 May until enemy resistance was finally overcome. The enemy fought furiously, defending every inch of the terrain as he withdrew to the south. The rainy season made living conditions as well as operations most difficult. Mud impeded vehicular transportation, and re-supply was accomplished under most adverse conditions. Casualties on both sides continued to mount and some criticisms were made which were based on casualty figures rather than the ultimate value of the base in furthering the war against the Japanese Empire.

All organized resistance ceased on 21 June 1945 with losses to the Japanese of 109,412 killed and 7,780 prisoners of war—a total of 117,192. Our casualties totaled 39,363, which included 7,554 killed, 179 missing, and 31,630 wounded.

The cost of this operation was great in manpower, the bloodiest campaign in the Pacific Ocean Areas. A campaign which lasted eighty-two days during which time the Japanese suffered losses of approximately three to our one. On Tarawa, the ratio of enemy losses was five to our three; on Saipan, seven to four; on Palau, two to one; and six to five in Iwo Jima. Okinawa was not so bloody in ratio, but the time length and the greater number of casualties made them appear greater than they actually were.

As facts have proved, the Japanese resistance here was their last effort to stem off defeat. Their ground resistance was fanatical and their air assaults in the form of kamikaze attacks were vicious and costly to our forces.

The Navy losses at Okinawa, most of which were due to these suicide tactics, totaled 4,900 killed or missing, and 4,800 wounded—nearly twenty per cent of the total naval casualties since the attack on Pearl Harbor.

Our air forces, based on this island, contributed substantially to the final capitulation of the Japanese by increasing the volume of air strikes against their homeland, and proved the strategic value of this base, costly though it was.

History will show this to be the last major operation of World War II, and an outstanding example of the results of close cooperation of all forces, Army, Marine, Navy, and Air.

The Two Atom Bombs

THE destruction was entirely incendiary in character, and the deaths were due almost entirely to fire and to falling structures. The victims were caught and pinned in the debris where most of them perished.

Most important, concrete buildings, even in the very heart of the bomb explosions, remained erect, though most of them were gutted by the spreading fire. More than that, even flagpoles, siren devices and other fragile objects on such buildings remained erect. There were no traces of unusual heat effects even on the tallest of the surviving buildings.

I do not hesitate to reiterate that two hundred Superforts loaded with incendiaries would have done as much damage to Hiroshima as the atom bomb except that the loss of life would most likely have been smaller.

* * * * *

The army leadership in Japan was irrevocably committed to the theory that air force is useful only in cooperation with surface force and in particular with land force. It was at all times reluctant to assist its navy, being compelled to do so only under the immediate threat of local disasters. Its aviation personnel was not trained to operate at sea, and, when the army did participate in combined operations with the navy, its aerial contribution was mediocre and sometimes proved to be an impediment.

Though Japanese military organization was similar to ours, it did not have our advantage of joint chiefs of staff at the top. Army and navy leaders conferred constantly to coordinate their action. But in the event of an impasse, decisions by top army and navy men were final in their respective fields. Consequently, most of the time, the army and navy pursued independent strategies which hastened their catastrophe. Only the Emperor himself could break a deadlock or resolve a contradiction.

* * * * *

Although Japan was a vastly inferior target, as compared with Germany, we applied against it a far superior air power, both in quantity and in quality. A single bombing attack on Japan at one time reached an aggregate weight seven times greater than the most powerful single blow delivered by American strategic air forces against Germany. German destruction from the air was accomplished by 1,600,000 tons of bombs; had we employed against Germany the kind of equipment used against Japan, as much as ten million tons could have been dropped in the same period of time; in that case, indeed, Germany—like Japan—could have been knocked out of the war without the necessity for invasion.

—*Major Alexander P. de Seversky.*

Administrative Publications

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IN the Zone of the Interior, publications issued by the War Department are reasonably well standardized. No such system of publications is used in the theaters of operations. This article is a suggested means of standardizing publications containing *administrative* directives that might be beneficial.

If an individual is assigned to a personnel or logistics staff section of a headquarters in a theater, several weeks frequently are required before he is able to find administrative directives in the numerous publications of the command. Usually, these publications do not contain type information concerning all phases of the activities of the command, a rather heterogeneous mixture. If the individual is assigned to a lower unit, he will also come in contact with these publications. The task of finding the specific directives is even more difficult at the lower levels of the command, where the publication did not originate.

The system of publishing administrative directives in the oversea theaters was workable as the war was over and the United Nations were victorious. The tools available did prove adequate for the job. However, the suggestions contained herein are believed to provide an even better set of tools to perform the job.

Headquarters in oversea theaters used a large number of publications. These included unnumbered memorandums, unnumbered circulars, numbered memorandums, numbered circular letters, numbered letters, letters, letters of instruction, administrative standing operating procedures, administrative circulars, administrative instructions, administrative letters, etc. Many more publications could be cited. Probably, when the publication originated, there was a limitation established for the type of information and directives that were to be included therein. This differentiation was soon lost in the maze of material published in each.

Most of the publications were not in a complete form but were bound together in a looseleaf fashion by the units as additions were received. The numbering of the items to be contained in the complete publication was such that the items were filed in sections thereof. The sections were confined to related subject matter items. In case the distribution was not exact, the individual who was maintaining the file was not aware of the fact until an additional directive was received for the section, and the numbering was out of proper sequence.

The specifications set up in this article for administrative publications, should, enable any headquarters, regardless of the level of command, to publish in three directives all the information and directives that it finds necessary to transmit to the lower units concerning administration. These three directives are Administrative Orders, Administrative Instructions, and Adminstrative SOPs.

The Administrative Order is an established publication in all theaters of operations. The form of the order or the sequence of items within the order does vary from theater to theater. Recommended forms for use in all theaters will appear in the revised edition of FM 100-10. The sequence of the items is the important matter in the form for an administrative order. The material to be published in the order is quite standard. The items to be covered should include sufficient information to:

a. Assign specific tasks to subordinate service units.

b. Inform supported units of the administrative establishments supporting them.

The Administrative Order can be made much more brief by reference, wherever possible, to Administrative SOPs. Where such a reference is impractical or impossible, the directives contained in the order will of necessity comply with the directives published by higher headquarters in their Administra-

tive SOPSs and Administrative Instructions.

Administrative Orders are published for application in a specific operation only. When the geographical location of the activity, the type of mission, or the magnitude of the command changes, a new Administrative Order must be published, as well as when the number of changes occurring since the issuance of the previous order makes a new order advisable.

The next logical consideration in this study is to differentiate between the types of items that should be published in the two types of recommended directives. For the purpose of determining the types of items to appear in these publications the purposes and scope of the two will be discussed.

Administrative Instructions

The Headquarters that will publish these directives will be relatively high level headquarters, because of the type of directives contained therein.

The purpose of this directive is to inform the units of the command of general policies to be used as a guide in performing the administrative missions assigned to these lower echelons. Policies are published by all of these headquarters concerning many of the items that appear in the Administrative Order. Policies concerning supply, evacuation, transportation, technical services, personnel and miscellaneous matters are formulated by these various headquarters and must be transmitted to the command. The lower units in the command use these policies in performing their administrative functions.

The different subjects to be covered mentioned above could all be covered in one publication. The logical arrangement for such a publication would be in six sections, the same as for an Administrative Order. Personnel needing information on any of these subjects could then look in the proper section of the Administrative Instructions and find what the policies of the higher headquarters are concerning that subject. For example, information concerning supply policies would be found in Section I of the Administrative Instructions, the same relative position as in the Administrative Order.

The information contained in this publication might be of constant use, or it might be used on one occasion only by a particular unit. The time of application of the directive is hence, quite flexible. This is in contrast to the Administrative Order that has a very limited time application.

Administrative SOPs

The purpose of this publication is to establish procedures for routine administrative operations that will be applicable for reasonably long periods of time. These directives will be much more in detail than will the directives contained in Administrative Instructions.

Headquarters at any and all levels could issue these publications. Some of the directives would be for use within the headquarters only, and some would have general application to the command. The ones having application within the headquarters only should not be distributed to the command in the regular publication. Directives applicable to the entire command, however, should be given the same distribution as the Administrative Order.

The form recommended for the publication of this type of directive is, as in the case of the Administrative Instructions, the same form as is used for the Administrative Order. A six section publication covering supply, evacuation, transportation, technical services, personnel, and miscellaneous should be used.

Standing Operating Procedures, as the name indicates, are established only when they will be applicable for reasonably long periods of time. It is only natural that there will be situations that arise wherein the directive will have to be modified for that particular situation. As soon as the peculiar circumstances are over, and the situation returns to normal, the directive will again be followed. The flexibility of this directive is much greater than that of the other two directives under discussion. If a situation

arises wherein the other two types of directives must be violated, the headquarters issuing the directive should be contacted for permission to change the procedure.

The advantages of all administrative directives can be classed under one of the three divisions mentioned above. If there is a question on the installation responsible for performing automotive maintenance for a particular unit, that unit will know to look in paragraph four of the current Administrative Order. If this same unit wants to know what latitudes of action it has in respect to cannibalization of motor vehicle assemblies, it will know to look in section four of the Administrative Instructions. If this same unit wishes information about the preparation of motor vehicles for amphibious operations, it will know that the procedures for this type of treatment will be found in section four of the Administrative SOPs. Another example of the advantage of the three publications is in the case of an individual newly assigned a particular job, such as personnel officer of an Air Force Squadron, an Infantry Battalion, or a Communications Zone Branch Depot. If he looks through paragraph five of the current Administrative Order, section five of the Administrative Instructions and Administrative SOPs, he will have all the information necessary for him to perform his functions, as far as specific procedures in his command are concerned. It is not intended to intimate that an individual can be made into a personnel officer, or supply officer overnight by these publications. With the proper background and training, however, he can more rapidly fit himself into the particular assignment in which he finds himself.

The Administrative Order will be given the correct distribution at an early date, or the administrative support will not function properly. Any errors in the distribution list will become apparent quite rapidly. If the same distribution is given the Administrative Instructions and Administrative SOPs, the directives will be reaching the necessary personnel and installations. The great bulk of other material that is contained in the various publications originating with the headquarters, not pertaining to administration will not be providing a maze of paper through which the administrative personnel must sort to find the information they need.

One volume will be used to contain all the information of each of the three types. Changes can be issued to bring the information up to date when necessary. When the number of changes becomes sufficient to warrant the publication of a new edition, the items contained therein will be reviewed to ascertain that they are up-to-date. There is a tendency to forget about publications that have been distributed previously if a separate publication is issued for each different small item. If, however, that information is to be re-published from time to time, there will be a tendency to review each item before it is put into the final form of the directive for re-publishing. This will tend to keep the directive issued by the headquarters more up-to-date in all ways.

Individual publications of varying size and shape will be eliminated, thereby providing easier physical handling of the publications. It is very disconcerting to have a large quantity of small and large size publications of the same general type that must be filed together. With one bound publication for each of the three types of directives, filing and handling problems are minimized.

Among the disadvantages of this system are matters such as complete re-publication being necessitated for each type of directive rather frequently. The reproduction disadvantages are less than the advantages gained, as mentioned above, by the frequent reviewing of the items contained therein.

The traditions of fighting men are long and honorable. They are based on the noblest of human traits—sacrifice.

General of the Army Douglas MacArthur

Some Problems of Air Intelligence

MAJOR CHARLES H. BARBER, *Air Corps*
Instructor, Command and Staff College

EXPERIENCE in World War II has originated and developed a completely new body of doctrine and procedures for air intelligence. In professional terms, these doctrines and procedures have been "evaluated" through trial by combat and represent realistic, rather than theoretical, foundations for air intelligence in the future.

Still speaking in professional terms, there has been a great deal of "dissemination" of the experience in the recent war. As fast as the lessons of combat were learned, institutions like the Command and General Staff School and the Army Air Forces Center incorporated them in air intelligence instruction. Air Forces and their subordinate units overseas were quick to adopt and include in training the ideas which filtered in from other commands and higher headquarters. Perhaps the most notable single contribution was that of the Royal Air Force, which continued throughout the war to supplement the intelligence functions of our European based air units.

It is clear, therefore, that present problems of air intelligence do not result from a lack of "evaluated" and "disseminated" information. On the contrary, the problems are rather those of "collation." The combat-tested methods of best creating air intelligence in all echelons remain to be dropped into their proper slots; an expanded terminology needs definition; and the theoretical command and staff relationship of the second and third staff sections can now be replaced by procedures that have been proved practical.

The recently published FM 30-5, "Combat Intelligence," which appeared in February 1946 says: "The basic principles of combat intelligence as set forth in this manual are applicable to air forces. However, intelligence procedure in air forces is necessarily different in some respects, and is prescribed in FM 1-40." The last sentence will undoubtedly raise many eyebrows. In the first place, FM 1-40 has not been revised since 1940,—meanwhile World War II has come and gone; in the second place, air intelligence differs from other military intelligence not only in some respects, but in many of its most vital applications. The air concept of objective information departs radically from that of comparable ground units; many intelligence functions common to smaller ground units are performed only at higher headquarters in the air forces; and many formalized staff intelligence practices have been informalized with effective results by air intelligence agencies. It is true, however, that the basic principles of arranging for the collection of information and its processing are essentially similar throughout the armed forces.

When and if "collation" of our World War II experience is undertaken, it seems important that stress be laid upon functions of the intelligence section at each level of command and for each type of aviation. This was done to some degree in preparing FM 1-40; but a very great expansion is indicated should a new air intelligence manual be published. Definite procedures, if carried out carefully at each level of command, assure that the intelligence produced is duplicated as little as possible and that the overall intelligence is highly accurate, timely and properly disseminated. In other words, the intelligence pattern then "fits together"; and needed intelligence is available when, where, and by whomever it is needed. Assuming that proper procedures are outlined, it remains only for doctrine to be organized into a handy, comprehensive and comprehensible form so that all air echelons and other interested agencies or commands speak the common language of modern air intelligence.

The problems of air intelligence arise from this effort to bring together the experience and knowledge that constitutes sound doctrine and to outline the responsibilities of the second staff section at each command level. Thousands of officers know

the answers to these problems as a result of participation in World War II; but their ranks are thinning. Our service schools, too, have many of the answers. However, with all deference to other authorities, it is proposed to outline a few of these problems and suggest their solutions.

First, there is the matter of objective information. This subject has been tremendously amplified during the past six years.

The problem with regard to objective information is double: (a) What types of objective information shall be produced? and (b) in what forms? The question of where they shall be produced is not raised because the exigencies of overseas operations may alter an ideal production plan. If we start with the air estimate as the highest level of objective information, we follow it with target systems, objective folders, target folders, approach charts and target charts down to the combat unit level. After this, we must define each of the above types of objective information, together with their variations for bombing through overcasts and related visual and blind air navigational aids. Certainly this is only a partial list of the kinds of objective information that have proved worthwhile. It seems desirable that all objective folders should be similar in format, and that standard arrangements of contents should be followed. It also seems that approach charts should be of certain scales, large enough to cover areas of uniform size on the approach to the target. Similarly, target charts should be uniform in scale and method of presenting target information. Once standardization is applied to objective information, there remain only the problems of production and dissemination at the proper levels.

Practically, there is no such thing as a tactical air order of battle. All air order of battle has strategic implications. Hostile air offensive or defensive capabilities within a theater of operations may be considered to affect the operations of even a single friendly group. This is an entirely natural result of the inherent flexibility of air power. Air intelligence officers have generally considered enemy air order of battle to do with the disposition, strength and organization of the enemy air force with special emphasis on combat morale. These same intelligence officers have set up separate "flak" intelligence divisions to provide the continual necessary revision of information about the enemy antiaircraft defenses. Similarly photo and "ferret" missions have been sent out to secure intelligence on such things as enemy warning installations, aircraft manufacturing facilities and new aircraft or airborne weapons. Why not include antiaircraft defenses in order of battle? Why not include enemy warning systems in order of battle? In fact, why not include in order of battle all the factors that go to make up the combat efficiency of the opposing air forces? These are not separate divisions of air intelligence; they are components of air order of battle. Why not call them that?

Technical intelligence poses another problem. FM 30-15 describing procedures which are only applicable in a general way to air units. After considerable evolution, air technical intelligence production became extremely efficient and of even greater value than in the early stages of the war. The air technical intelligence on the Pacific was organized in a completely different way from that in the other theaters of operations. The problem here is to determine the type of technical intelligence organization or organizations which will be maintained and the extent of the intelligence staff officer's responsibility toward them. The technical intelligence team feeding into the Air Technical Service Commands at various levels seems to be as good a solution as any, even if there continues in existence a joint staff agency such as the Technical Air Intelligence Center at Anacostia. This solution has the further advantage of "feeding back" much technical intelligence, in a minimum of time, from the producing air service command level nearest to combat.

In theory, the air intelligence officer is supposed to set up a formal or informal intelligence plan, and to prescribe photo and tactical reconnaissance missions to secure for him the answers to the essential elements of information. The assignment of these missions is sup-

posed to be made in the intelligence annex to the field order. Also in theory, the second staff section had been delegated the responsibility for information about weather affecting operations over enemy territory. These procedures have been radically changed in practice however. Weather is now the responsibility of the special staff weather officer, who advises the whole command. While the intelligence officer may, in some cases, assign air reconnaissance missions in the intelligence annex, it is a far more common practice for the operations officer to make these assignments by means of fragmentary orders or use of standing operating procedure at the informal request of the intelligence officer. The problem here is simply one of substituting new usage for previously outlined procedure, at all or only at certain specified command levels.

Then there is the problem of the estimate of the enemy air situation. The emphasis is, of course, on objective information and capabilities. Very few air headquarters ever arrived at the formal two paragraph estimate contained in FM 1-40. What happened in most cases was that the intelligence section worked continuously on objective information in order to be able to supply objective folders, target folders and target charts whenever they were needed in planning or carrying out operations. Upon the announcement of the mission, all presently available information was used jointly by operations and intelligence as required. The presentation of enemy capabilities at any given time was usually informal. As a matter of fact, the operations estimate of the situation, generally a planning conference, duplicated all of the data called for in the intelligence estimate of the situation. It is important to note that the collaboration of the second and third staff sections preparatory to the issuance of a field order by the A-3 is not unlike the cooperative effort of the first and fourth sections preliminary to the publication of an administrative order, which later goes out bearing authentication by the A-4. The extent of these divergent practices raises the question of the future of the formal estimate of the enemy air situation.

So far no mention has been made of censorship, handling of visitors, counter-propaganda, espionage and counter-espionage. The body of knowledge on all these subjects was increased during World War II and in many cases, new procedures were developed. Variations in theater policies affect censorship practices; and the character of the civilian population modifies greatly espionage, counter-espionage and propaganda methods, as was witnessed in Africa and the Far East.

Experience acquired by trial and error methods during World War II resulted in the successful development of doctrine, aids and a working organization in the field of survival, evasion and escape. The humanitarian and conservation aspects of this important activity, primarily developed for air personnel, requires that these subjects be included in the training of air intelligence officers. The problem is to teach these subjects and maintain due regard to their highly classified character.

Only a few current air intelligence problems have been outlined above. One that might have been developed at length is uniformity in mission reporting. The difficulties of statistical control when mission information is not uniformly reported are too obvious to be worthy of explanation. There were dozens of different mission report forms in use during the recent war. The problem is to develop the one best form for presenting tactical results, statistical data and intelligence for each type of aviation.

In thorough-going "collation" of our air intelligence experience lie the answers to all these problems. In the future, it may be necessary to decide when an airborne missile ceases to come within the air intelligence officer's purview and passes to ordnance and artillery. This is not as pressing a matter, however, as the need for the official and up-to-date publication of air intelligence data which will supersede the present FM 1-40 and amplify the applicable basic doctrines of FMs 30-5 and 30-15.

MILITARY NOTES AROUND THE WORLD

GREAT BRITAIN

Iceberg Plane Base:

One of the weirdest stories of the war came to light recently—how the Allies planned to create a 2,000,000-ton self-propelled iceberg as a floating airfield.

As blueprinted by the British, the fantastic aircraft carrier would have been a chunk of frozen water and wood pulp 2,000 feet long, 300 feet wide and 200 feet deep. Propelled by electric motors and defended by its own antiaircraft guns, it would have provided a North Atlantic base for airplanes hunting German submarines. Its cost was estimated at $70,000,000.

The project reached the point where a 1,000-ton model was built on a Canadian lake and tested for six months in 1943 before the idea was dropped, according to an announcement released in Ottawa, London, and Washington.

Technicians reported the strange carrier would have been virtually invulnerable to submarine attack. A torpedo exploding against its ice-wood walls would have gouged out a crater no more than three feet deep.

Success of other antisubmarine tactics and technical difficulties in building the gigantic floating field led to its abandonment.

(From a news report)

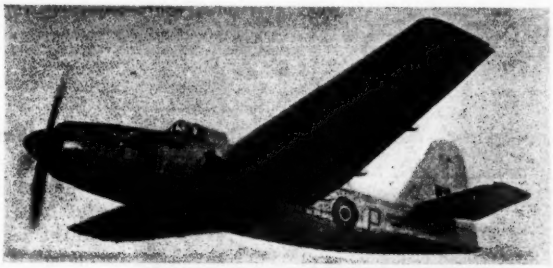
Radar Equipment with a "Memory":

One of the latest pieces of radar equipment in use in the British Navy is a robot, known as an AF ("automatic following") device, that possesses an electrical "Memory." When radar warning of an approaching aircraft is received, a button is pressed on the AF equipment and the aerial immediately begins to search the sky. Within a few seconds it locates the target and "locks" on to it, indicating its achievement by a flashing green light. From then on the aerial automatically follows the target "memorizing" its course and speed if it passes behind another object, and the equipment passes a continuous flow of electrical information about it to the gun predictors.

(*The Times Weekly Edition*, Great Britain)

The Fairey "Spearfish":

This is a photograph of the Fairey prototype "Spearfish," now under construction for the Royal Navy. The aircraft is powered by a Bristol Centaurus engine of 2750 horsepower which drives a Rotol five-bladed constant-speed airscrew. The spacious fuselage, which carries the attack weapon internally, should be noted, as well as the wing-flaps, which give exceptional maneuverability for



The Fairey "Spearfish."

deck landing and take-off. The "Spearfish has a high cruising speed and a long range.

(The Illustrated London News)

Royal Marines' Commando Brigade:

A Commando Brigade of about 3,000 men will be maintained as part of the peacetime strength of the Royal Marines.

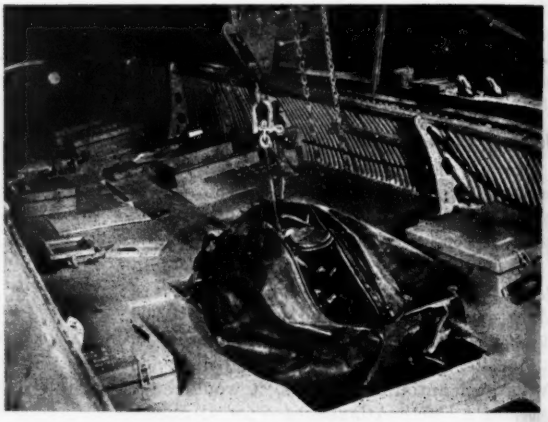
This decision means that the special organization and technique for amphibious attack, built up by soldiers and marines of the Commando group during the war, will be preserved and still further developed. Every Marine will do a spell of Commando service as part of his normal engagement. He will be a volunteer only in the sense that every regular Marine is a volunteer.

(From a news report)

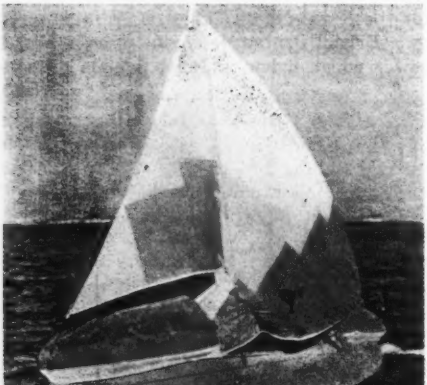
Airborne Lifeboat:

The airborne lifeboat developed during the war under the sponsorship of the Air Ministry, has great potentialities for the saving of life in time of peace. The craft, which can be carried by, and parachuted from any average bomber type of aircraft is thirty feet long, and, propelled by its eight horse-power Austin lifeboat engine, is capable of 8½ knots and carries enough fuel for 500 hours' cruising. By 1914 a number of "ditched" bomber crews had been saved by this means. Air-inflated fore-and-aft casings make the boat self-righting and afford protection for rescued men. The engine works inside a synthetic rubber casing, which protects it from sea-water. The boat includes all necessary navigational equipment and food in watertight lockers.

(The Illustrated London News, Great Britain)



Engine being lowered beneath deck.



Boat under full sail.

AUSTRALIA

Jeep that Flies:

An Australian invention which enables an ordinary jeep to fly is off the secret list. A fuselage and autogyro propellor are attached to the jeep which is towed into the air by a plane. When it gets to its destination, the jeep is cut free and can land in a small area with the rotor blades acting like a parachute. All you have to do then is to pull off the fuselage and the propellor and drive away.

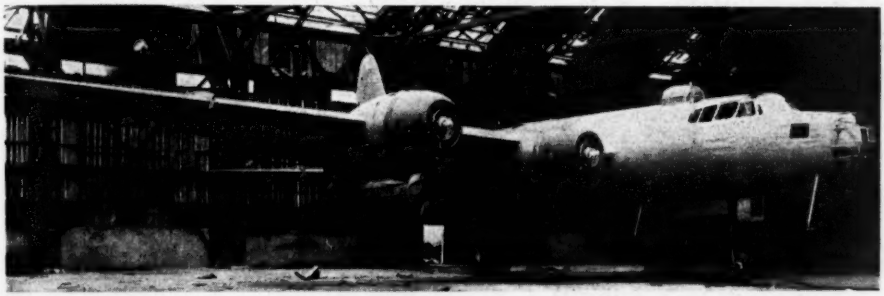
(Australian Weekly Review)

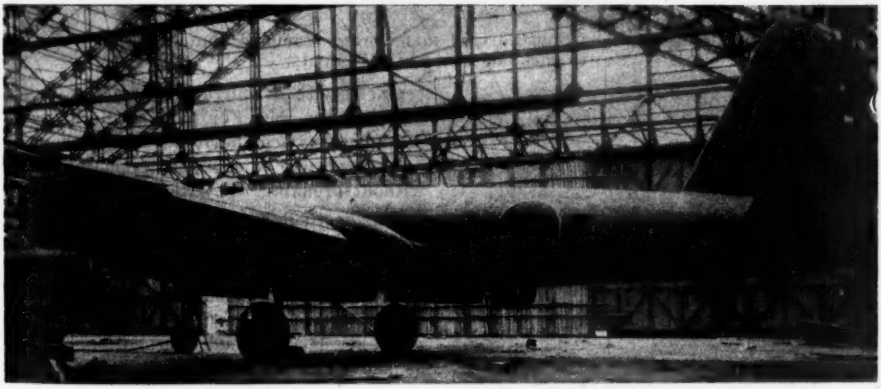
JAPAN

Japanese Four-Engine Bomber:

Found by United States Navy technical air intelligence officers when they landed in Japan was this new Japanese Navy four-engine bomber. Called "Rita" by the Americans, it is estimated to have a 4000-mile range with full bomb load and 4800-mile range without bombs. Its maximum speed is about 360 miles an hour. So far as is known, this new plane was not used before Japan surrendered.

(From a news release)





Front and side views of bomber. (Official U. S. Navy Photos.)

USSR

Soviet War Production:

Generalissimo Stalin cited figures which show the technical equipment of the Red Army during the war. The tank industry, during the last three years of the war, produced annually an average of more than 30,000 tanks, self-propelled mounts, and armored cars. The aircraft industry produced, during the same period, annually, as many as 40,000 planes.

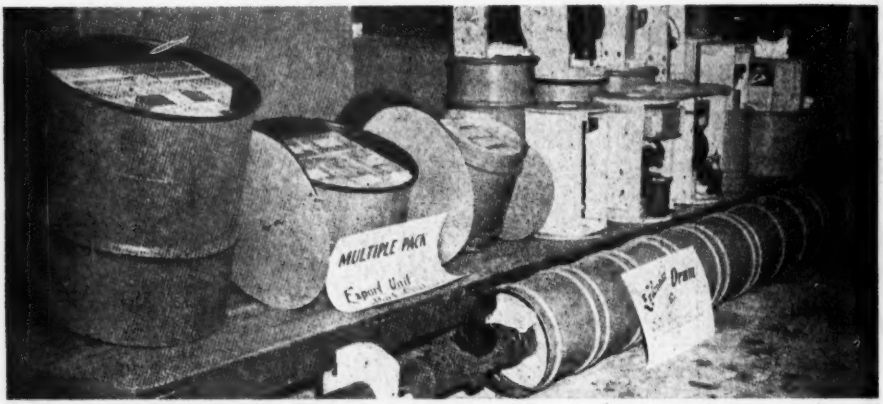
The ordnance plants produced annually 120,000 guns of all calibers, as many as 450,000 automatic rifles and heavy machine guns, more than three million rifles, and some two million submachine guns. Thus, in 1944 more than 240 million shells, bombs, and mortar projectiles and 7,400 million rifle cartridges were produced.

(Krasnaia Zvezda)

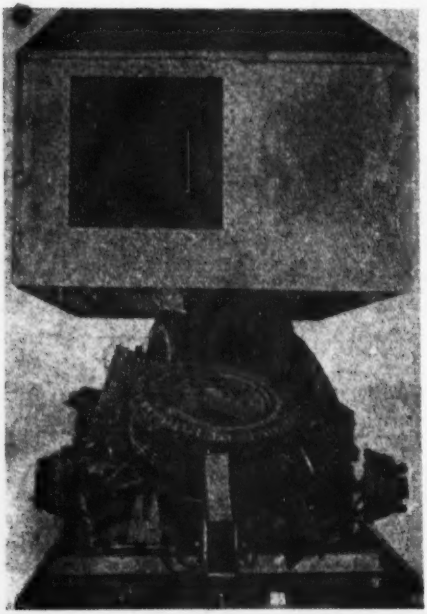
UNITED STATES

Hermetically Sealed Storage:

A packing method that consists of constructing hermetically sealed steel "cans" has been devised. A desiccant is used to remove the last traces of moisture absorbed on the surface inside the container, and the air is replaced with a neutral atmosphere, such as dry nitrogen gas. For field artillery "cans," a method has been devised whereby the recoil mechanism can be exercised from the outside without breaking the seal.



Extended or shortened drums made from standard containers to pack odd-shaped instruments.



Aluminum balanced pressure barrier being lowered over a 40-mm gun and carriage.

This method has also been applied to all kinds of ordnance equipment, such as instruments, small arms, mortars, and tanks. In some cases standard drums, which greatly simplify the problem of design and procurement, are used. Extended or shortened drums, as shown in the accompanying illustration, can be used as well as specially designed containers, such as the one for a director.

Proving that size is no limitation, plans are being made at the Office, Chief of Ordnance in Detroit to "can" a heavy tank. The feature of this pack is a pressure-controlling bellows, which is essentially a cartridge containing the same gas as is used in the container and designed to maintain a fixed pressure.

The costs involved in "canning" are a vital consideration. Study of the problem has proved that canning is actually the cheapest way of preserving ordnance equipment for

long periods, such as twenty-five to fifty years. Figures now available indicate that the maximum cost of canning to preserve the matériel for this period will be about five per cent of the matériel value.

(Army Ordnance)

A Troop Carrier Record:

The 13th Troop Carrier Squadron of the 13th Air Force flew over nine million miles during thirty-three months of Pacific war without loss of a single plane due to mechanical failure. Three aircraft were lost, however; two disappeared while on flights into combat zones and one crash-landed on a submerged reef after running out of fuel. Nine planes were damaged during the thirty-three month period, and three others returned to base on single engine. All damaged planes were returned to active service.

The squadron recorded 61,000 flying hours during this period; and all engines, new and overhauled, averaged 675 hours.

(Released by Headquarters, 13th Air Force)

Rubber Decoys:

The photos show a rubber "decoy" LCT being inflated under the direction of United States Army Engineers (Figure 1). An exact replica of the LCT is this rubber version used to "decoy" and outwit enemy forces on the landing of United States troops on beachheads. This mattress is the stem section of an LCT. Released as one of the secrets of camouflage in World War II.

Figure 2 shows the rubber LCT partially filled with air with the ramp up.

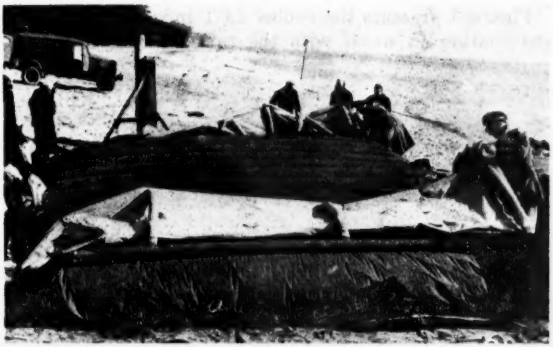


Figure 1.

Figure 2.

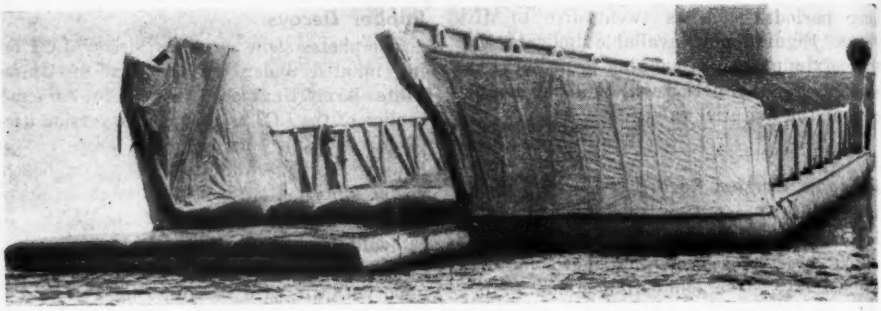


Figure 3.

Figure 3 presents the rubber LCT inflated and floating on water with the ramp down.

Figure 4.

Figure 4 is a view of the pneumatic LCT being towed out into open water. This dummy would draw enemy fire and relieve the pressure on real LCT's loaded with men and increase their chances of landing on a beachhead safely. (These are all U.S. Signal Corps photos.)

(From a news report)

New Rocket Motor:

The navy permitted disclosure of what is described as the "newest and most powerful rocket motor in the world"—a unit that delivers 66,000 pounds of thrust for two seconds.

Known as "Moby Dick," the motor is intended for use in jet-assisted aircraft takeoffs or to propel aerial rockets. The navy said the new unit would triple the speed (now 900 feet a second) of its "Tiny Tim," a 12-inch aerial rocket weighing 1,300 pounds.

Moby Dick is 105 inches long, 17 inches in diameter and weighs 5,800 pounds. It was built by Aerojet Engineering Corporation of Azusa, California, in conjunction with the bureaus of ordnance and aeronautics.

(From a news report)

Recoilless Mortar:

When the war closed, the Chemical Warfare Service had a recoilless mortar "goon gun" in the field and ready for battle use. It is a new brother of the famous and battle-proven 4.2-inch chemical mortar. Besides being shock-proof, it is more portable and also capable of point-blank fire. It is an improvement on the accuracy of the "goon gun," because it can be fired straight into pillbox apertures, caves and dugout openings, windows, etc. The new gun is described as follows:

"A distinct feature is the recoilless mortar's weight. It tips the scale at only 170 pounds, which is about half the weight of its older brother. Using a standard 30-caliber machine-gun mount, it does away with the heavy baseplate of the mortar and the necessity for preparing a position in advance. Three men can conveniently handle it.

"The new weapon owes its non-recoil to a tube and reaction chamber, the latter being screwed on the rear of the barrel. Open at the far end, this chamber allows gas from the explosion of the propelling charge to escape in the rear to compensate for the jar from ejection of the shell.

"Few targets can escape this glamorized 'goon' which can be elevated forty-five degrees or depressed fifteen degrees, and traversed 360 degrees."

The new mortar fires a modified standard 4.2-inch chemical mortar shell containing white phosphorus—for incendiary or smoke effect—or high explosive.

(Army and Navy Register)

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Air, Land, and Sea Warfare

Digested at the Command and Staff College from an article by Marshal of the Royal Air Force Sir Arthur Tedder in the "Journal Royal United Service Institution" (Great Britain) February 1946.

FIELD Marshal Smuts, referred to the peace we are now trying to build up as "Peace with Teeth." The great majority of people are tired of, bored with, war in all its aspects. There is danger in this: if the "Peace with Teeth" is to be maintained, those teeth must be sound, and if we are to be sure that the teeth are sound we must determinedly and dispassionately analyze this last war. We must dig out the underlying truths. We must find out what really happened. We won the war; but why did we win it? And how did we win it? It took us six years to win this war—a good deal longer than the previous war; was this inevitable with the political cards stacked as they were, or could we have done better? Was our national effort employed in the most economical way for the war as a whole? Equally, on the other side, why did our enemies lose? What were the weaknesses in the structure of the great German war machine which led to its final collapse?

War is the aftermath of the failure of diplomacy, but it is the continuation of policy and its object is to enforce that policy as economically as possible. I mean the economy which results from keeping every component part of the national war machine properly balanced in relation to the rest of the machine—no passengers and no overgrown heavyweights, no empire building by sectional interests of services. For modern war is total; it is a unity involving every branch of national life.

Within the ultimate unity of a nation at war there are various components of the national effort each of which had a unity in itself: there is the war of production, which is fought in the factories; there is the war of civil defense; there is the war on land; there is the war at sea; and the war in the air—each of these having its own essential unity; each closely interrelated with the others to make up the ultimate unity of the national war machine.

As a result of hundreds of years experience and tradition, no one questions the entity, of land warfare and sea warfare respectively. In the old days, except for a few rare geniuses like Pitt, they used to be regarded as quite separate and apart. Even in these modern days there have been examples of this separatism. I do not believe that the Germans ever got their land and sea policies really closely knit into a proper coordinated whole. With regard to the air, the very idea of air warfare as such is new—very new indeed when considered in relation to the history of war as a whole. Consider first the Germans during this war: they had a separate air service of which they boasted much; but all the history of this war goes to show that they completely failed to understand the real meaning of air warfare as a separate problem: they considered it merely as an accessory, a useful accessory, to land warfare. The Luftwaffe of the early days was trained and equipped as an ancillary to the land armies. The fact was that in those early days the Luftwaffe was able to intervene in the land battle without having to fight an air battle first. On their opponent's side the two prerequisites for success in the air were lacking—firstly, adequate strength, and secondly, secure bases. At the end, however, of the conquest of western Europe, the Nazis found themselves faced by Great Britain and faced for the first time by true air warfare. Events soon proved, what experience in France had already indicated, that the Luftwaffe was neither equipped nor trained for real air warfare. Fortunately the Royal Air Force, relatively small though it was, was fit for the air battle, and the Nazis lost the Battle of Britain first by day and then by night. We never lost air superiority over this country, but it was a long time be-

fore we had the means to stretch that air superiority first across the Channel and then, with the help of our American Allies and comrades, gradually across northern France, Belgium and Holland, and finally over Germany itself.

The fight for air superiority is a complex problem. It may be necessary in the early stages for all the component parts of an air force to concentrate on the immediate objective of air superiority. Without a reasonable degree of air superiority, no air force can effectively assist land or sea forces or strike at the enemy's war potential. To attempt to do so without a reasonable degree of air superiority is literally suicide. In the early stages of the war we were compelled to do this at times and lost some of our bravest and best in the process.

In the early days of the war, there were some who failed to understand the nature of air superiority or to realize that it was a vital prerequisite to success in modern war, whether on land, at sea, or in the air. In the last few months of the war the Allies had secured virtual air superiority over the whole of Germany. Allied land and sea forces were able to move and operate with the freedom which would otherwise have been impossible, with even greater freedom than the Germans had been able to operate at the outbreak of the war. The Allied Air Forces were able to devote by far the greatest part of their effort to direct and indirect support of the land operations and to the direct strangulation of the enemy's war machine.

I think the outstanding characteristics of air power are the flexibility and the terrific concentration which proper use of that flexibility gives it. If by overspecialization you destroy that flexibility you will not get the concentration. If your organization is such that your air power is divided up into separate packets and there is no overall unity of command at the top, once again you will lose your powers of concentration. Air power in penny packets is worse than useless. It fritters away and achieves nothing. The old fable of the strength of the bundle of faggots compared with the weakness of the individual stick is abundantly true of air power. Its strength lies in unity.

But this unity is not exclusive, any more than the other unities which go to make up the national war effort are exclusive. In particular, the operation of land, sea, and air forces are closely related. The relative size of forces and the relative scale of effort of those forces will vary in different campaigns and in different stages of each campaign. But whatever those variations, the operations in the three elements are interdependent.

The first round in modern war takes place in the air—the fight for air superiority; and to be successful one must have reasonable strength in quantity as well as quality, and one's air bases must have security—the security given by warning systems, by dispersal, by protection, and by guns. We must be frank in analyzing the past, not in the sense of criticizing or assigning blame—that leads nowhere—but in the sense of learning from our mistakes. The lesson is clear. It was no use having a victorious and predominant surface fleet if it was not free to operate because we had lost control in the air; it was no use in having a strong army if, for the same reason, it could not be supplied and maintained.

Each of us—Land, Sea, and Air Commanders—had our own special war to fight, each of us had his own separate problems; but those separate problems were closely interlocked, and each of us had responsibilities one to the other. Given mutual understanding of that, you get mutual faith; and only with mutual faith will you get the three arms working together as one great war machine. I am sure that is true, whatever system of command you adopt—three independent Commanders in Chief or one Supreme Commander.

This matter of mutual understanding and mutual faith is particularly important as regards the Air Force. The air war is of vital importance to the operations at sea and on land. It is natural, and indeed, essential, that Sea and Land Commanders should take a very real interest in what the

air forces are doing—just as the Air Commander must know exactly what is happening on land and at sea. Plans should, in fact, be joint—a land/sea/air plan. But if there is distrust there will be a tendency for Land and Sea Commanders to want their own little bits of air force. I remember in the early days instances of division and corps commanders demanding their own allocation of fighter squadrons; the old story of the choice between single faggots or the bundle of faggots. Fortunately, in the Mediterranean theater we had the bundle, and I am sure that was one of the secrets of success; the air effort concentrated to meet the problems of the moment.

The question of unity arose afresh in an urgent form when the Allied landings took place in North Africa. The most immediate problem was the air. The moment the landings took place the enemy communications from Europe to Tunisia became the vital key to the whole issue, for once again it was a race for reinforcements and supply. Immediately after the landings took place the Middle East air forces took up the sponge to help General Eisenhower's campaign. Malta was reinforced. Tunis, Bizerta, Palermo, and Catania, and the shipping passing between them, became the targets of our aircraft. Under General Eisenhower there were two other air forces, one British and one American, with a tendency for the latter to be further split. Here was the very negation of concentration. The army problem was not quite so urgent, there was an Allied Army in the west and a British Army in the east, working towards the same object, but still geographically some way apart. The issue, however, was clear—the bundle or the separate faggots; and it was decided at Casablanca. The air and land forces were unified, each under a single commander.

One thing I have learned in this late war is that the personality of the few men at the top—commanders and staff—matters far more than I ever conceived. I am absolutely convinced that for modern war, with all its inter-relationships, you must have commanders and staffs who fit together, who will work together. I am sure you have to be ruthless in this matter. Give them time—time for strong characters to adjust themselves to each other, but if, after giving a fair chance for the initial sparks to die down, sparks still fly—be ruthless—sack the non-cooperator.

The unities of which I have spoken themselves effect economy in so far as they make practicable the concentration at the vital point by which a unified force can defeat a numerically stronger force which lacks unity. But I think the principle of economy must apply to every aspect of war. By economy I do not mean doing things cheaply; I mean getting the maximum of effect with the minimum of effort. Above all, in these days of total war, no nation can affort to waste manpower or material. Just as we cannot afford uneconomical methods in production, so also we cannot afford uneconomical methods in actual warfare.

I feel there are two things we must do. First, we must analyze the events of this last war dispassionately but ruthlessly without any bias. We must analyze our own and our allies' operations on land, at sea, and in the air, and still more important, we must consider our military effort as a whole. Were our forces properly balanced? Was our national effort properly distributed? Then we must do the same as regards the enemy's military effort. He certainly went wrong, but what were his mistakes? Was his failure due entirely to political misjudgments or were there weaknesses in his military machine? Much thorough and judicial work is needed to find the answers. But found those answers must be; otherwise the teeth we maintain to keep the peace will be unsound.

Our second task is, with the lessons of the past in our mind, to face up to the future—not an easy thing to do. Fantastic crystal gazing will get us no further than will rigid conservatism—both would be fatal. We must start from the firm basis that ruthless analysis of this last war will give us and we must discard equally ruthlessly ideas, traditions and methods which have not stood

the test of economy, and then we must look right ahead. I myself believe that the keywords for the future are flexibility and speed. I feel that the days of the leviathan are over so far as warfare is concerned, whether on land, at sea, or in the air. I think the future lies with David, not Goliath. No peace-loving democracy will tolerate maintaining a Goliath in peace time, and I am sure that in another war we would not be allowed the three years grace we had to build up our Goliath this time. No, in my opinion, each service must clear out old shibboleths and outworn traditions, go to the scientists and technicians for all they can possibly give in the way of speed, mobility and economy, develop the whole time with an eye on the other two members of the team in cooperation and not in competition. Couple this with the mutual frankness and mutual faith which gave success in the war, and then we shall get what we need—a united, efficient and economical armed force, not an embryo Goliath which would take years to come to maturity, but a full grown David, fighting fit, ready to act swiftly and decisively as one of the world's policemen. To return to Field Marshal Smuts' metaphor, our teeth will then be sound and ready to bite instantly and decisively.

Cooperation Between Fighter Planes and Tanks

Translated and digested at the Command and Staff College from a Russian article by Lieutenant General E. Savitskii in "Krasnaia Zvezda" (Red Star) 28 November 1945.

MANY of the offensive operations of the Red Army were characterized by deep penetration of hostile rear areas by our tank units. One of the fundamental features of such penetrations was the vulnerability of tanks from the air, especially in assembly, intermediate, and attack positions, and also at the time of their commitment in the breakthrough area. In the latter case, the tanks required dependable protection against the counterattacks of the enemy's air forces.

In many operations, it fell to the lot of our air unit to protect our tanks from the action of enemy air forces. The success of this protection depended not only on our general superiority in the air but also on the perfection of the cooperation between our tanks and fighter aircraft throughout all stages of the operation.

The organization of this cooperation was usually begun during the period of preparation of the operation. At this time, the staffs of the units worked out a plan of cooperation. It embraced the periods of concentration of the tanks at the intermediate and attack positions, the period of the breakthrough, and the first days of operation of the tanks in the depth of the enemy position. In this plan were indicated the time of the beginning of the operation of the tanks in each stage; the time of the arrival of the advance tank units at specific terrain lines; the axis of tank movement; means of communication; and the definite missions of the fighter planes during each stage.

On the basis of this plan of cooperation, prepared by the air and tank commanders, and the general air situation in the sector, the air staff elaborated plans relative to the employment of the air units, the displacement of their bases to new airfields, signal communications, and the location of command posts and radio stations. Qualified liaison officers were stationed at the headquarters of the tank units. A separate plan was prepared for air reconnaissance activities in the interest of the commander of the tank units.

This procedure, however, was not always followed. In one of our operations, for instance, owing to inadequate radio equipment, contact was lost with the tanks during the period of their rapid advance, and we were

even forced to hunt for our own tanks by means of special reconnaissance planes.

In another case when, for a number of reasons, it was not possible to depend on radio, we used the method of continuous patrolling by fighter aircraft over the area in which the tanks were advancing. This, of course, led to the unproductive expenditure of forces, fuel, and motorized equipment.

The technique of cooperation between tanks and fighter aviation was best developed in the Vistula-Oder operation, though here, also, certain difficulties occurred. These were caused by the high tempo of the tank advance and by considerable distances separating the leading tanks from the infantry. The operation was successful because of the accurate and detailed preparation of the plans of cooperation between the tanks and fighter aircraft in each stage of the operation. In these plans, main attention was given to the organization of means of communication, control of the fighters, and the shifting of air bases and of air service units.

During the course of the operation, the control of the fighter planes and their cooperation with the tanks was handled from the command post of the commander of the air unit. This command post constituted a well developed center of radio and wire communication. Having good radio contact with the liaison officers of the air units in the leading tank detachments and with the headquarters of the tank and fighter units and the fighter aircraft in the air, and being in possession of the data provided by the radio locator stations, the senior air commander was always well acquainted with the ground and air situations and was able, if the battle situation required it, to augment the strength of the fighter forces in order to preserve air supremacy in the sector in which the tanks were operating.

Moving impetuously ahead, the senior tank commander requested the fighter units to maintain a continuous watch over the area ahead of and on the flanks of the sector in which the tanks were operating. In order to expedite the transmission of reconnaissance data to the leading tank detachments, a special, "reconnaissance" wave was established. The radio sets of the planes and tanks were tuned to this wave length. The results of observations were transmitted from the plane and, after the plane had landed, were again transmitted to the headquarters of the tank unit.

Operation of reconnaissance planes and tanks on a common radio wave-length at times provided the opportunity on the part of the observation planes for giving direct aid to the advance tank detachments. Thus, for example, a group of observation planes noticed our tanks engaged in a fire fight with an enemy artillery battery. The commander of the group established contact with the tankmen by radio. The tankmen requested him to locate the artillery blocking their progress. The fliers detected the enemy battery, communicated its coordinates to the tankmen, and the latter attacked and neutralized it. Taking advantage of this situation, the tankmen forged ahead and seized possession of an inhabited place.

In addition to well organized liaison, the success of the cooperation between fighter planes and tanks in the Vistula-Oder operation was aided by the skillful displacement of the airfields and the efficient handling of the air service units. The complexity of the task was due to the rapid advance of the tanks and the distance between them and the infantry which, at times, was as much as 100 kilometers. This increased the radius of action of the fighter units, for there was not a sufficient number of airfields in the zone of action of the advancing tanks.

But in spite of the complexity of the situation, the displacement of air-bases was carried out successfully. This was aided, first of all, by a continuous search from the air for new airfields in the territory still in the possession of the enemy. In addition to this, aviation engineers and the elements of the air service units moved forward with the tank units. With the arrival of the tanks at the site of a new airfield, they went to work, without delay, preparing the airfield for the

arrival of fighter aviation. Not infrequently, our fighters in their effort to follow constantly behind the tanks, seized possession of new airfields long before the arrival of the infantry in the area. The shifting of bases and the operation of these airfields were carried out under the direct protection of specially selected tank units.

The foregoing remarks indicate that the effective cooperation between fighter aviation and tanks calls for the following:

1. To plan cooperation for all stages of the action of tank units. The planning must cover even the period of preparation of the operation.

2. To provide the air and tank unit headquarters with radio equipment capable of maintaining contact with the advance tank units, with the headquarters of infantry divisions, and with the airborne planes.

3. To make wide use of radio locating equipment for the timely discovery of the air enemy and effective employment of the fighter aircraft.

4. To plan carefully for the displacement of airfields to insure uninterrupted accompaniment of the tanks.

Operations of the Second Polish Corps

Digested at the Command and Staff College from an article by Colonel H. Piatkowski in "The Army Quarterly" (Great Britain) October 1945 and January 1946.

THE front in Italy was stabilized on the general line: Ortona—River Sangro—Cassino—eastern slopes of Monti Aurunci. Successful landing operations were limited to the Anzio bridgehead. The road to Rome remained closed. The 15th Army Group plan for the new offensive consisted of an attack, in the first stage on the southern flank of the front, to be followed a few days later by a breakthrough from the Anzio bridgehead. The bulk of the Eighth British Army and the whole of the Fifth American Army were to take part in these operations. The sector selected for the offensive was bounded by the Cassino area in the north and in the south by the Anzio coast.

The defense of the southern sector of the enemy's front, which it was intended to attack frontally, was based on two chains of mountains: one in the area of Cassino, consisting of the massive Mt. Cifalco, Mt. Cairo and Mt. Cassino; the second, south of the first chain, the Mt. Aurunci range. The valley of the river Liri divides these two chains. In general, the bulk of the Eighth Army was directed against Cassino and the area of the Liri valley, with the task of breaking through the enemy's lines of defense and advancing on Rome. Further to the south, two corps of the Fifth American Army were to attack the Mt. Aurunci chain.

The Ground.—To get an idea of the general layout of the ground, imagine a huge amphitheater at the top of which, in the center, is Mt. Cairo, with two arms—Mt. Cifalco and Mt. Cassino—stretching forward to the east and the south respectively to form a semicircle.

This great amphitheater is a composite entity, each section bearing an influence on the others. Hence, attacking forces advancing on Mt. Cifalco from, say, San Elia-Fiume-Rapido, would be under flanking fire from Mt. Cairo and reverse fire from Mt. Cassino. The objective of the II Polish Corps' attack was Monte Cassino which, flanking the Liri valley from the north, covers the descent into this valley from the east. In order to make the operation in the Liri valley possible, it was essential to include Mt. Cassino as one of the objectives of the attack. From the above it is clear what would be the results of an attack on one part only of the amphitheater. The only practical solution was to attack the whole defense system simultaneously, thus forcing each separate objective to defend itself and thereby preventing the defenders from reinforcing each

other. But in war there are never enough troops, so the Poles were not surprised when informed that neither Mt. Cairo nor Mt. Cifalco were to be included in the offensive.

This limitation was necessary, but how were we to conform to this? The nearest objective to Mt. Cairo is the Corno Pass. If we captured the Corno Pass, we should cut off the southern arm of the amphitheater right at its base, thus isolating this arm with Mt. Cassino at the far end. But that would not be all. In the area of the Corno Pass is the junction of the two German lines of defense, the capture of which would mean the breaking of both German lines of defense at one stroke. The advantages seemed to be immense.

Nevertheless, we had to abandon the idea of capturing the Corno Pass for two reasons: first, because of the lack of troops, and secondly—a technical reason—because of the range of our artillery. Even had we captured the Corno Pass the artillery, from its distant positions, would not have been able to ensure covering fire against enemy counterattacks. It was impossible to bring the artillery nearer because the Rapido valley was under observation from Mt. Cifalco.

The Situation and Task of the II Polish Corps

The Corps consisted of: two infantry divisions, the 3d Carpathian and the 5th Kresowa, an Armored Brigade, an Army Group of Artillery, and the Carpathian Reconnaissance Regiment, with engineer, signal corps and administration units.

Each division had its battalion of machine guns, engineers, signal corps and administrative units. Each division of artillery consisted of five regiments, three field, one antitank and one antiaircraft.

Initially, before the final regrouping for the attack, the area of Mt. Maiola, in the southern sector, was occupied by the Carpathian Rifle Brigade and the area of Mt. Castellone, in the northern sector, was held by the 6th Lwow Infantry Brigade. The remaining two brigades were far behind, rehearsing their respective tasks. In the rear, i.e., to the east of the two first line brigades, was the artillery area. The first line infantry was therefore separated from its artillery by the wide Rapido valley.

Let us now examine this grouping in relation to the chain of mountains: Mt. Cifalco—Mt. Cairo—Mt. Cassino. Mt. Cifalco flanks the whole Rapido valley from the north and the gun area and the infantry positions on Mt. Castellone and Mt. Maiola. Mt. Cairo provides frontal observation on the Rapido valley and gun positions and at the same time permits observation of the rear of the first line infantry. Mt. Cassino provides frontal observation on that part of the Rapido valley lying to the east of Cassino and simultaneously flanks the part of the valley lying to the north of Cassino. It therefore brings the gun area under a slightly oblique observation and the brigade position under flanking observation.

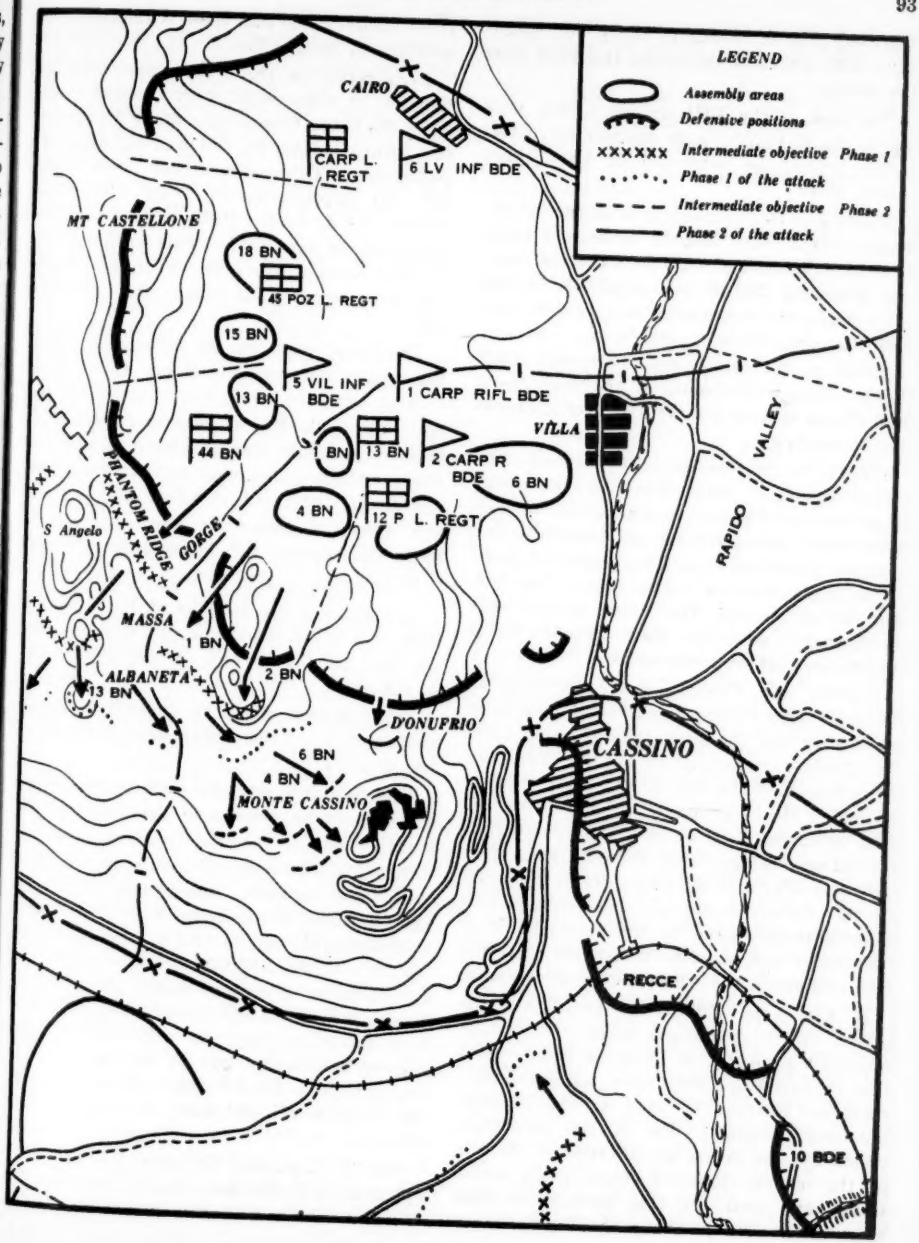
After numerous changes, the Polish Corps had the 2d New Zealand Division to the north, with the 6th Brigade on the left; to the south was the 4th British Infantry Division with its 1st Guard Brigade on the right.

The general line of the German "Gustav" and "Adolf Hitler" defense positions are shown on the map. The enemy positions had not been adequately reconnoitered. In particular, their defense works which were well camouflaged to match the surrounding landscape, could not be located. In addition, some of them were built on reverse slopes, making ground reconnaissance impossible. There were no orthodox defense works on the position, such as old type trenches or barbed wire—nothing, in fact, which could give any clue to the system of fortifications. Mines and booby traps were extremely well laid.

The following task was assigned to the Corps:

Phase 1.—To isolate the area of Cassino Abbey from the north and northwest and to occupy Highway No. 6 till contact with the XIII Corps was established. Then to capture Cassino Abbey Hill.

Phase 2.—To establish contact with the "Adolf Hitler" Line in the area north of


LEGEND
Assembly areas
Defensive positions
Intermediate objective Phase 1
Phase 1 of the attack
Intermediate objective Phase 2
Phase 2 of the attack
CAIRO
CARP L. REGT
6 LV INF BDE
MT CASTELLONE
18 BN
45 POZ L. REGT
15 BN
13 BN
5 VIL INF BDE
1 CARP RIFL BDE
VILLA
44 BN
1 BN
13 BN
2 CARP R BDE
6 BN
4 BN
12 P L. REGT
PHANTOM RIDGE
GORGE
S Angelo
MASSA
1 BN
2 BN
ALBANETA
13 BN
D'ONUFRIO
6 BN
4 BN
MONTE CASSINO
CASSINO
RECCE
10 BDE
VALLEY
RAPIDO

Highway No. 6, thence to carry out operations with a view to encircling this road from the north.

The task of the XIII British Corps, with whom the II Polish Corps cooperated in this action under the command of the Eighth Army, was:

Phase 1.—To capture and hold the bridgehead on the river Rapido between Cassino and Liri; to isolate Cassino from the west, cut Highway No. 6 and establish contact with the II Polish Corps; and to mop-up Cassino and open Highway No. 6.

Phase 2.—To gain contact with the "Adolf Hitler" Line to the south of Highway No. 6 and thence to attack it with a view to breaking through.

The German Position.—The German defense positions were based on the rocky mountains, which were organized into strongpoints and defended localities. Generally, the position presented three very strong bastions of defense: Monte Cassino Abbey, Hill 593, and Mt. S. Angelo. The whole position was dominated by the Corno Pass, with Mt. Cairo (1,669 meters) overlooking it.

Neither Mt. Cairo nor the Corno Pass were included in the objectives of attack, so the enemy had the advantage of using them for observation as well as for fire. The plan to isolate first the Abbey and later capture it, led to the selection of S. Angelo as the first objective. This method had yet another advantage, namely, that the attack on Hill 593, over which led the only suitable approach to the Abbey, would not be isolated. The Poles therefore came to the conclusion that they must first capture S. Angelo and Hill 593, and storm the Abbey in the next phase.

It was very difficult to coordinate the attack on S. Angelo—a large and distant objective, protected by Phantom Ridge—with that on Hill 593, a very near, small and self-contained fortress. The real strength of these mountain positions lies in the protection which the gun crews are afforded in shelters on the reverse slopes of sharp, rocky walls. Caves are used for this purpose or else shelters are dug in the rocks. Concealed in these shelters, the gun crew is immune from artillery or mortar fire.

Preparation of the attack was very systematic. It commenced with reconnaissance. First the Corps Commander made flights over the future battlefield, followed by divisional commanders. Other commanders were carrying out reconnaissance from observation points. The divisional staffs studied the plans for attack on sand tables. This work gradually went down to the lower levels and finally the units began their rehearsals far in the rear.

The Corps plan was as follows: To break the enemy defenses on Monte Cassino, attacking with the whole Corps along the central line: Colle Maiola—Massa Albaneta. To capture and hold the southwestern slopes of the mountain with a view to securing ground observation on the Liri valley and isolating the Abbey of Monte Cassino. Later to assault and capture the Abbey from the west.

This action was to be covered by:

(a) Holding the defenses of Mt. Castellone Hill, and neutralizing enemy firing positions on the Corno Pass and the adjoining ridge to the south.

(b) Constant artillery concentrations on the defenses of the Abbey until the time of the direct attack on it.

One battalion and one tank regiment was to be in corps reserve in area of Portella-S. Michele.

The 5th Kresowa Division, reinforced by tanks and engineers, was to capture S. Angelo and Hill 575 and thence exploit Balkon (505-452,447), and to hold Castellone Ridge. The 5th Wilno Brigade was given the task of capturing Phantom Ridge and then S. Angelo, while the 6th Lwow Brigade was to hold Castellone together with two cavalry regiments, keeping one of its battalions in support of the 5th Brigade and two others as the reserve of divisional and corps commanders.

The 3d Carpathian Division, also reinforced by tanks and engineers, was to capture Hill 593 and Massa Albaneta and in the second

phase to capture Cassino Abbey. This attack was to be carried out in two phases:

Phase 1: Main effort to capture Hill 593-Massa Albaneta-Hill 476. 1st Carpathian Rifle Brigade with 12th Podole Lancers Regiment, supported by tanks (one troop), self-propelled guns, flame throwers, mortars and machine guns, was to capture first Hill 593 and Massa Albaneta, and then Hills 476 and 450, which were later to be used as the starting line for 2d Carpathian Rifle Brigade in Phase 2.

The 2d Carpathian Rifle Brigade was to be in reserve for Phase 1. In Phase 2 it was to capture Monte Cassino Abbey from the direction of the serpentines (southern approach).

The First Attack.—According to the long-prepared plan, the offensive began on 11 May at 2200. The opening stage was commenced by counterbattery fire. At 2340 hours, the XIII British Corps, supported by an artillery barrage, went into the attack. On other sectors, the softening-up of the enemy positions by artillery still continued.

The attack of the II Polish Corps was launched according to plan on the 12th at 0130 hours by the storming of Hill 593 by the 3d Carpathian Infantry Division. Soon action was joined along the entire corps sector with the 3d Carpathian Infantry Division assaulting the gorge and the 5th Kresowa Infantry Division assaulting Phantom Ridge.

The 5th Kresowa Infantry Division's Attack.—Under the German artillery counter barrage, the Fifth Wilno Infantry Brigade went into the attack on Phantom Ridge. Two battalions succeeded in breaking in on the Ridge and even passed over it in two places. The reserve battalion disorganized by the defensive fire fell back. The first two battalions also had to be withdrawn. The attack broke down.

The 3d Carpathian Infantry Division.—The 1st Carpathian Rifle Brigade attacked with one battalion through the gorge on Massa Albaneta, and with the other on Hill 593. The first battalion was split in two by heavy German artillery fire. Some sub-units continued to advance for some time. Then, although they had now been joined by other sub-units, worn-out by heavy fighting, they halted.

The second battalion made a fine attack on Hill 593, whence they commenced to advance on Hill 569. The success did not last long and this attack suffered the same fate as its predecessors.

After the First Attack.—The battle on the sector of the II Polish Corps had already reached its critical stage, by noon on 12 May. The First Brigade of the 3d Carpathian Infantry Division had suffered heavy losses. The Second Brigade was untouched. The Fifth Brigade of the 5th Kresowa Infantry Division was badly mauled. The attack, which was launched with great *élan*, was confronted with the same difficulties of terrain as all previous attacks, as well as by a deadly fire from the enemy, who lived up to his highest battle reputation.

The Pause Between Attacks.—While some units of the 5th Kresowa Division were reorganizing for a new attack and others were awaiting orders, constant patrolling and night attacks were carried out along the whole II Polish Corps sector, in order to keep the enemy under a strain. The success of the neighboring troops in the south was growing and the prospects of isolating Abbey Hill were improving. The Mersey line was reached by the XIII British Corps on the 14th at 1100 hours. Fighting patrols, local attacks supported by artillery and mortars and a tank attack on the gorge confirmed that the Germans were occupying Phantom Hill and Hill 593.

Second Attack.—Though the objectives were the same, experience from previous attacks showed that the Massa Albaneta strongly protects Phantom Ridge from the flank, making it difficult to capture frontally. The Commander of the II Polish Corps, therefore, made the following changes. The axis of the attack of the 5th Kresowa Division was directed away from Massa Albaneta, leaving out the southern part of Phantom Ridge and embracing only the northern part of it. The next objective was S. Angelo.

The 3d Carpathian Infantry Division was

ordered to direct its attacks on Massa Albaneta more from the side (i.e., from the east), from the slopes of Hill 593. A group was directed frontally against Massa Albaneta, strongly reinforced by tanks and supporting arms, in order to engage the enemy defenses.

The 5th Kresowa Division.—On 16 May the action commenced by an attack on Phantom Ridge at 1800 hours. The commander of the attack had at his disposal more than six battalions. He first threw in only two which finally captured Phantom Ridge in the early hours of 17 May. Thereafter, the attack penetrated still deeper. At dusk, the dogfight for S. Angelo was still undecided, part of it being still held by the Germans and part by the Poles. From dawn till noon on 18 May the fighting continued with varying success. Artillery and air support was called on many times.

The 3d Carpathian Division.—On 17 May at 0730 hours the Second Carpathian Rifle Brigade went into the attack. The 4th Battalion, paying heavily for every yard of Hill 593, succeeded in capturing and holding its eastern slopes. Similarly, the 6th Battalion, after fighting all day, gained more ground by successfully breaking into the bunkers position on the western slope of Hill 593 in the direction of Massa Albaneta. This action was supported by Polish tanks, which fought a sharp engagement against the center of resistance on Massa Albaneta, attacking it from the north through the gorge. At this stage of the Polish attack, it became apparent that on the south the British Corps was progressing well. During 17 May they reached Highway No. 6, via Casilina, and by dawn of 18 May, had captured the highway. The moment when the two allied pincer movements would be completely closed was not far off. On 18 May, the 6th Battalion captured Massa Albaneta and at 0950 hours the garrison of Cassino Abbey surrendered to the 12th Podole Lancer Regiment. Later during the day, patrols of the XIII British Corps and of the II Polish Corps met. The Germans after having abandoned Cassino Abbey, continued to resist on S. Angelo. The Commander of the 5th Carpathian Division threw into the attack his last reserves. S. Angelo fell on 19 May at 1900 hours. One and a half hours later patrols entered Villa S. Lucia. The division established contact with the 4th British Division.

As a result of the capture of Monte Cassino, the "Gustav" Line was broken on Highway No. 6 leading to Rome. But the advance in this direction was halted once more by the defensive locality of Piedimonte, which was part of the "Adolf Hitler" Line. The task of covering this action by capturing Piedimonte was entrusted to the II Polish Corps.

At dawn on 25 May the last German strongpoints in the town were mopped up. On the same day the hill to the north of Piedimonte was captured. Our aim was achieved—Piedimonte was in our hands.

Monte Cassino and Piedimonte were captured. The road to Rome stood open. The momentum of the allied offensive, and in particular their fierce attacks on the "Gustav" Line, so shook the enemy that he was unable to put up any strong resistance until after the fall of Rome.

Though the battle was one of material, in the first plan two factors emerged:

1. The difficulties of the rough mountain terrain proved once more that technical power is still impotent against the forces of nature.

2. In the final moral test, the surrender of the Abbey signified that the German will to resist was broken before the enemy was actually defeated in a material sense.

Both these factors show that nature and spirit can still triumph over technique and material. Remembering the hard road to victory, it must be concluded that without proportional preparation and outlay to the achievements required, positive results cannot be obtained.

Unity of Command

Translated and digested at the Command and Staff College from an article in Spanish in "Memorial del Estado Mayor" (Colombia) January-February 1946.

IT has been admitted from time immemorial that the efficient command of any unit requires the centralization of command in a single commander who is advised by a staff. This rule holds even when the unit in question is made up of entirely heterogeneous elements, such as in the case of mixed brigades and divisions.

An identical need exists for a supreme or unified command of all the armed forces of a country. Almost with the force of axiomatic truth or of any established principle in political and military science, recognition of this fact is becoming daily more widespread among the nations. However, the reasons behind it bear repeating.

In reality the question of national defense is an indivisible whole. It therefore must comprise, if and when required, all the living forces of the country that has to face the supreme test of war. It is natural, however, that the employment of those forces, especially the army, navy, and air arm, will not yield maximum and thoroughly integrated results if all are not subject to a single coordinating mind and the will of a single commander.

Moreover, national defense is of such primary importance for the existence of any sovereign nation that it must be provided in everyone of its multiple aspects and in smallest detail within a sufficiently broad but fixed plan, which is possible only if there exists a unified command. This general plan, the development of whose groundwork should commence long before hostilities start, will include as an essential part the relationship between the armed forces and the country's civilian agencies such as industry, banking, and communications, so that all may contribute to a unified and harmonious effort for the supreme need of the nation.

This plan of national defense should be marked by its stability and continuity, so that it may not suffer from continual changes in its substance at the hands of those commanders succeeding to overall direction; such changes in orientation serve only to annull the work accomplished by predecessors and to disconcert subordinates in their activities. The personal ideas of each individual collaborating in the task should be adopted only after careful study, to formulate an official plan of defense which is immutable and general in its lines.

There arises, therefore, the need of establishing that unified command which is best achieved through a single department of war or National Defense and towards which there is today a universal tendency. World War II, with its pressing need of coordination among all arms, and of the latter with the civilian world, showed clearly that the continued unconnected operations of these agencies were impossible, no matter how different their characteristics and how peculiar to themselves their technique might be.

Thus all countries having a department of National Defense with a general staff of its own have handed over to it the overall direction of all arms and services in what pertains to fundamental employment and organization, leaving to the commanders of each the full administrative, economic and operational freedom necessary for its work.

These means afford to whatever extent is foreseeable, the unified command which is necessary for the good of national defense, and at the same time it allows that relative but ample autonomy which the army, navy, air corps and services require. It therefore seems to be the means best suited for adoption as a definite norm in the organization of our armed forces.

In war it is not always possible to have everything go exactly as one likes. In working with Allies it sometimes happens that they develop opinions of their own.
Winston Churchill, quoted from "Life"

The Strategy of the Red Army

Translated and digested at the Command and Staff College from a Russian article by Major General F. Isaiev in "Krasnaia Zvezda" (Red Star) 20 February 1946.

THE strategy of the latter half of the XIX Century and of the first World War was, in its form, a lineal strategy, that is, it deployed all armed forces in one strategic echelon, with all the armies disposed, basically, along one and the same line. Victory was sought through the employment of lineal forms of operations where the outcome of campaigns was decided by one strategic echelon. One or both strategic flanks of this echelon could be enveloped, and this often meant victory for the adversary who enjoyed numerical superiority.

During the first World War, there appeared a new factor—a continuous front stretching from one sea or from one neutral country to another. Strategic flanks had disappeared, and lineal strategy found itself in a dead end. All attempts of the adversaries to overcome the solid position front did not meet with success, for means for the development of breakthrough were then lacking. A talented leader of the old Russian army, General Brusilov, attempted to solve this difficulty in a novel manner. He broke up the hostile line over a tremendous frontage of some 400 kilometers, but, with no means at his disposal to exploit this success, his effort to achieve a strategic victory failed.

German *blitzkrieg* was not only a one-sided "tank-airplane" variation of warfare, but also, and above all, the strategy of "Invasion echelon." The invasion echelon was the backbone of all operations, and into this echelon the enemy put all his forces. But the strategic disposition of the German armies was, in essence, that of a single echelon, and was, in effect, a variation of the obsolete conceptions of lineal strategy.

Even at the beginning of the war, the Red Army countered the German invasion not with a line of armies, but with several strategic echelons disposed at a tremendous depth. Bleeding and wearing out the enemy by active defense, the Red Army withdrew toward the new strategic echelons which had been deployed in previously selected areas. Thus, our resistance was growing, while the offensive possibilities of the enemy were decreasing. This eventually enabled the Red Army to stage a formidable counteroffensive, first near Moscow and later at Stalingrad and Kursk.

This retrograde movement is not comparable to the maneuver of Kutusov in 1812, For at that time the Russians fought only two large battles while retreating, one at Smolensk and one at Borodino, and there were no new armies in the rear areas. Unlike Kutusov's strategy, the Red Army retired with *uninterrupted active defense action*, while new forces, in increasing numbers, were being deployed in the rear areas. Then followed a rapid transition from strategic defense to strategic counteroffensive on an unprecedented scale.

Capitalizing on the advantages of their treacherous invasion, the armored German armies managed to penetrate deep into the territory of the Soviet Union, but no strategic breakthrough was ever attained. The outline of the front at the time when the enemy was still on the offensive shows that all the breakthroughs effected by the enemy were only depressions in an unbroken front, for before the enemy there always stood new Soviet troops. The German strategy of invasion failed against our wisely organized and deeply echeloned front, and so did the blitzkrieg.

German strategic doctrine underestimated the importance of defense, for *blitzkrieg*, by its very nature, excludes defense. Unlike German strategy, the strategy of the Red Army combined, both defensive and offensive action, and considered defenses as a means for the preparation of offensive operations. It also contained a new method of changing directly from defensive to offensive strategic action on a gigantic scale.

Based on the skill to create advantageous conditions for a counteroffensive in the course of defensive action, the new method is successful when the command knows how to employ formidable reserves at the correct time and in decisive directions, and how to choose the time for launching the counter-offensive. All this has been demonstrated in the battles of Moscow, Stalingrad, and Kursk. The strategy of depth was most successfully employed in the colossal strategic operations of the Red Army in the period between 1942 and 1945. Here, for the first time in the history of warfare, military operations were carried out by grouped *army groups*, disposed in multi-echeloned strategic formations in decisive directions. It was this disposition of forces that enabled the Red Army to deliver its splitting blows to a depth of 400 or 500 kilometers in some 17-20 days. Such was the case in White Russia, in Iassy-Kishinev operation in the summer of 1944 and in the battles between the Vistula and the Oder in the winter of 1945.

During World War I, strategic breakthroughs were, in most cases, failures. In the offensive operations of the Red Army we observe a new phenomenon of warfare: strategic breakthroughs in the form of blows splitting not only the hostile front but also his strategic rear areas. The prototype of this form of offensive is found in the remarkable offensive of the Civil War when Stalin tore through the White Army from Orel and Voronezh to Taganrog and Rostov. This blow split in two the forces of Denikin and resulted in a total defeat of the White Army.

In the first World War, strategic operations following the establishment of continuous fronts were not successful. All, even the greatest operations of that period were, in effect, isolated and local. Such were the offensives of the Allies between Soissons and Rheims in April 1917; the protacted operation in Flanders, the battle of Cambre, the German offensive at Arras and La Fere in March 1918, and their last offensive in July 1918. In this war, German operations, from the time when the Red Army had completed the mobilization of its main forces, never spread beyond the limits of one strategic direction (Stalingrad in 1942 and Kursk in 1943), and all resulted in catastrophes for the invader.

The offensive operations of the Red Army, on the other hand, were not isolated operations. They were tied together by one general strategic idea, and embraced the operations of several army groups. Furthermore, these operations, in all the campaigns of this war, commenced in one area and then, with a constant and all-destroying force, unfolded with still greater intensity all along the front and through its depth. From Stalingrad to the Don Basin in the winter of 1942-1943; from Kursk to Ukraine and Smolensk in the fall of 1943; from the Dnieper to the Carpathians and from Leningrad and Novgored to Pskov in the winter and spring of 1944; from the Beresina to the Vistula and Neman and from Iassy to the Danube in the summer and fall of 1944; and from Warsaw and Budapest to Berlin, Vienna, and Prague, in the winter of 1945. Such was the scale of the unfolding strategy of the Red Army. This progressive mounting of operations was possible because of the planning and thorough organization not of separate offensives, but of campaigns as a whole.

It should be noted that in the most complicated and difficult form of offensive, the encirclement followed by the destruction of large forces of the enemy, the Red Army has surpassed all classic examples. This new art of encirclement has evolved new forms and methods of warfare, such as double encirclement, quick splitting of encircled groups, and their piece-meal destruction. These tactics and strategy call for exceptionally precise control on the part of the Command and for the strategic cooperation between adjacent army groups. Of the long list of such successful operations, Stalingrad, Korsun-Shevchenkovskii, East Prussian, and Berlin operations are only a few.

Thus, this war has produced new forms and methods of strategic control of armed forces. Even in the first World War, military leaders of the various armies were compelled,

in order to coordinate the efforts of several armies engaged in one strategic direction, to group them into army groups or "fronts." The Russians were the first to group their armies into three fronts: Northwestern, Western, and Southwestern. But having created fronts and army groups, the high commands were kept away from direct control of large-scale operations, for all important strategic directions were entrusted, as it were, to Army group and front commanders. These "fronts," as a general rule, were stretched out over larger areas than was the case in this war, and the strategic coordination of the operations of several "fronts" was indeed weak.

The Red Army has developed a new method of strategic control and has organized and carried out its operations in a manner which insured, on each of the strategic directions, a logical and effective coordination of efforts of several fronts.

The Future of the Giant Submarine

Digested at the Command and Staff College from an article by Frank C. Bowen in "The Navy" (Great Britain), February 1946.

WITH the Japanese naval architects so anxious to introduce entirely new types, particularly those which make a great public impression, and the very keen interest which they displayed in the big German U-125 which was handed over to them for experiments after the 1914 war, a great deal of curiosity has been shown by professional men in the designs of the giant submarines which they had been reported, from time to time, as building. Some details of those handed over have been published, which suggests that the Allies will find a great deal of technical interest in their examination, but whether they will find anything in them that will persuade the British and United States Navies to go in for giants is quite another matter.

Until now the gigantic submarine has been the pet dream of all the navies which make a big feature of corsair warfare, but none of them have satisfied expectations. The Germans were preparing them from quite an early period of the 1914 war, but the first to be built, in what could be then regarded as the giant class, were the two cargo submarines *Deutschland* and *Bremen* built in 1915 to run the British blockade to the United States. They had dimensions 213 feet by twenty-nine, giving a submerged displacement of 1,900 tons, and before they were completed quite a number were laid down. The *Deutschland* made two round trips in safety, the *Bremen* was rammed and sunk on her first outward voyage, and the remainder together with the *Deutschland* were taken over by the German Navy and converted into cruiser submarines with a submerged displacement of 2,300 tons. The crack aces in the U-boat service were urged to take their command, but they all did everything that they could to avoid the honor; as practical men they realized that such ships would be hopelessly unhandy for commerce destruction and they very much preferred the smaller and livelier vessels.

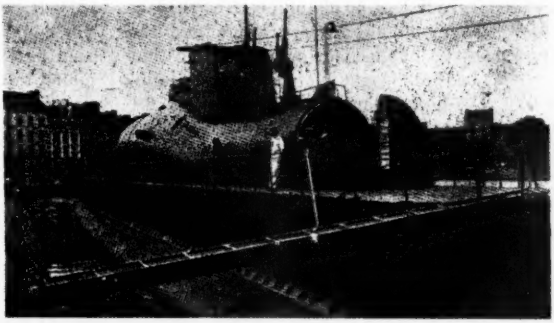
Nevertheless, the Berlin Admiralty proceeded with the construction of a new type of submarine cruiser, 344 feet long, 3,500 tons submerged displacement, with a surface speed of seventeen knots. They were followed in the last year of the war by nineteen knot, 4,000-ton ships and the laying down, by Krupp of Kiel, of a still bigger vessel which was to contain innumerable innovations, was provisionally known as UD, but never even approached the launching stage. It was later admitted that her design had revealed any number of unexpected difficulties and German submariners were unanimous in considering that she would never work, while they had not a word in praise of the submarine cruisers which were completed.

The British went up to a submerged displacement of 2,650 tons in the famous "K" class purely for the purpose of getting their surface speed of twenty-four knots, which would permit them to cruise with the Grand Fleet, and some of these were converted into the unlucky "M" class of submarine monitors.

Nearly all our practical submarine men were against such size, but the theorists, and a few officers in other branches of the service, were attracted by the idea of giants which could stow fuel to take them all over the world, could mount heavy guns for bombarding and other purposes without being such a bad platform that those guns were useless and could, in the drastic reduction of the British Fleet, divert the attention of many enemy vessels by their ability to appear in unexpected places. As was only to be expected, certain elements in the French Navy were particularly enthusiastic and one of the first suggestions made was that a big class of gigantic submarine transports without any means of offense and little of defense, should be built in order to maintain "France's Lifeline" between Marseille and Northern Africa. Interesting plans were drawn up for these ships and aroused a good deal of discussion, but they were never built.

In 1923 the Admiralty built the famous X.1, a ship with dimensions 350 feet by twenty-nine feet 9 inches by seventeen, her surface displacement being 2,780 and her submerged displacement 3,600 tons. She mounted four 5.2-inch guns, two machine guns and six 21-inch tubes; her diesels were designed to give her a speed of 19½ knots on the surface and nine knots submerged. She was a pure experiment and was criticized from the first. She was put into reserve in 1931 and was broken up in 1936.

The French *Surcouf* of 1929 was even more ambitious. On dimensions 361 by 29½ by 23½ her two displacements were 2,800 and 4,300 tons, her designed speed eighteen knots on the surface and ten submerged and her radius of action 10,000 miles at ten knots. She mounted two 8-inch guns, the biggest allowed to any "auxiliary vessel" under the Washington Treaty, backed by two 37-mm antiaircraft and four machine guns with ten 21.7-inch torpedo tubes. A plane with folding wings was stowed in a special hangar by the conning tower. She is reputed to take over two minutes to submerge and to have failed to make her designed speed by a considerable margin. She was sunk during the war, apparently by collision, but the full details have not yet been published.



The giant French submarine *Surcouf* with hangar door open.

As soon as Japan reached a certain stage in her plans of aggression she greatly intensified the veil of secrecy which had long been spread over her naval intentions, but many rumors were current concerning her plans to put into practice the keen interest of her people in giant submarines, of which they had previously made no secret. These reports, like all of that kind, had to be accepted with a good deal of reserve, but when Japan finally surrendered, and the British and American Navies took over the remnants of the Japanese Fleet, it proved that there had been a good deal in them. The original program was apparently for twenty-eight giant submarines of varied design but all having a big cruising radius. They were originally intended for the invasion of India in conjunction with Hitler's plans for a southward drive, their particular function being

to maintain the blockade, but only a few units were even laid down and it is quite likely that a good deal of the program was "window dressing" for Hitler's benefit.

At the same time some were certainly built and commissioned. *I-400* commissioned in December 1944, was the biggest to be captured and examined. With a length of nearly 400 feet she had a displacement of 5,500 tons, a crew of 191 and, probably an estimate, a cruising radius of 50,000 miles. Her surface speed was given as thirteen knots and the Japanese who handed her over admitted that it took her at least five minutes to submerge. On deck there was a mounting for one 5-inch gun—not the four 6-inchers which had been rumored—but only an antiaircraft piece was actually carried. A catapult was laid on deck and three small planes with folding wings were stowed.

Considering Japanese policy as shown during the progress of the war, and the use to which they put their submarines in all parts of the Pacific and Indian Ocean, the possibilities of a submarine cruiser of that kind, with the power to disappear for considerable periods, would appear to be almost unlimited. Yet apparently the only use to which she had been put was to carry supplies and key personnel to the naval base at Truk. That would scarcely be justification for building such a big and expensive vessel.

The Battle of Provence

Translated and digested at the Command and Staff College from an article in French in "L'Armée Française au Combat" (France) November 1945.

THE landing in Southern France was to comprise two phases:

The first, the assault phase, consisted in the establishment of a solid bridgehead between Cavalaire and Saint-Raphaël by landing three American shock divisions and French elements, the whole to be commanded by General Truscott. The French Naval Forces under Admiral le Monnier were to participate in it.

The second, was the exploitation phase, during the course of which four French divisions commanded by General de Lattre de Tassigny were to land, once the bridgehead had been established. Then, with the American troops that were already landed, they were to form the 7th Army under the command of General Patch.

While the American divisions moved in the direction of Grenoble, a French division would provide a screen in the direction of Aix-en-Provence for the rest of de Lattre's Army, which was to march on Toulon and Marseille. The French Forces taking part in the operation were the following:

A combat command from the 1st Armored Division, landing at Saint-Raphaël, one commando group, and one naval assault group. All these elements were to participate in the assault phase with the American divisions.

In the exploitation phase the 1st Infantry Motorized Division, the 9th Colonial Infantry Division, and the 3d Algerian Infantry Division would participate.

In addition to these ground forces there were French naval units consisting of one battleship, four cruisers, three light cruisers, five torpedo boats, six dispatch boats, five destroyers, three oil tankers, and one government transport.

Naval aviation elements specialized in the location of mines.

The air forces provided one reconnaissance group, six pursuit groups, and six medium bomber groups.

The operation as thus organized was to take place seventy days after the landing in Normandy, and the air bombardments effected by more than 1500 planes were carried out between 10 and 14 August.

At that time the general strategic situation was as follows:

In Normandy the battle of Avranches had

been won and Rommel's counterattack, launched with four Panzer divisions on 7 August, had failed. The envelopment of the 7th German army in the Argentan-Falaise corridor was in full swing. The enemy still had Group "G" of armies, under the command of General Blaskowitz, in southern France. These forces, although harassed by the French Forces of the Interior and troubled by demolitions, would have been able to retreat in such a way as to permit the Wehrmacht's establishing a solid barrier on the general line: Seine—Saone—Rhône.

In the east, the Russian offensive had reached the Vistula south of Warsaw and the Gulf of Riga. It was important, therefore, to make it impossible for the Germans to withdraw troops from the west for reinforcing their eastern front.

The landing in Provence was, for all these reasons, of considerable importance. It not only liberated France, but it restored our freedom in the Mediterranean and permitted the reestablishment of our relations with North Africa. In short, it restored our Army.

The French Army

Army "B," as the Army of General de Lattre was designated at that time (later known as the French Southern Army and afterwards as the French 1st Army) constituted, on the eve of the landing, a very considerable force. It included the Italian Expeditionary Corps, which had fought desperate battles in the Apennines and covered itself with glory at Cassino, the Moroccan cavalry, the 1st Free French Division, the 3d Algerian Division, the 2d Moroccan Infantry Division, and the 4th Moroccan Infantry Division. From North Africa were to come the 9th Colonial Infantry Division, the 5th Armored Division, and the 1st Armored Division. There were also large commando, parachute, and shock battalion units as well as armored reserve-regiment forces reinforcing the divisions.

The Instructions to the Command

On 6 August, personal and secret instructions gave to the commanders of the large units, the following directives:

1. To push rapidly west in the general direction: Cavalaire—Solliès—Le Beausset, attempting constantly to move northward in order to outflank the coastal resistances.

2. To attack Toulon, in two combined operations: one frontal, in the direction: La Crau—La Garde; the other, spreading out as far as the Signes—Chibron—Le Beausset highway, in order to effect the encirclement of the city by way of the hills on the west.

As a matter of fact Toulon, with Marseille, was an anchor point which the subsequent operation would have to make use of, and it was imperative that it be taken.

The mission of the 3d Algerian Infantry Division was:

1. To outflank the city of Toulon by way of the terrain elevations and to prepare as soon as possible for seizing possession of the fortifications of the north front.

2. To spread out continually in this encircling maneuver, as far as the Signes—Chibron—Le Beausset highway, in order eventually to effect the encirclement of the suburb west of the city. The more tenacious the defense proved to be, the further to the west the encircling operation was to be pushed.

3. To take advantage of every occasion offered for penetrating into the city.

4. To secure the assembly position, Mount Redon—Pierrefeu—Pelgros ridge.

5. To threaten the northern front of the fortified area by occupying the Saint-Hubert hills and crushing the resistance at Solliès.

6. To reconnoiter and protect themselves in the direction of Aubagne and Aix by means of armored forces pushing toward the axes: Cuers-camp of Chibron, and La Rocquebrussane—Saint Maximim.

Meanwhile the additional forces were to move along the high ground between these routes, from La Barre de Cuers to the Sainte-Baume mountains.

Protected thus, the main effort of the division would be against Jas-de-Laure and the camp of Chibron.

The German Defense of the Mediterranean Wall

The landing was well planned, the initial operations worked out, and orders were is-

sued. On 12 August. on board the *Batuori*, General de Lattre had called together the commanders of his major units to give them his last instructions.

The German 19th Army had nine divisions in the line and a reserve composed of one armored division (the 11th Panzer Division), one armored regiment (the 200th Panzergrenadier Regiment), and one regiment of the *Ostlegion*. The divisions in the line were stretched out from Cerbère to Menton. The 242d in the Toulon area and the 244th in that of Marseille, had orders to hold out at any cost.

The general coastal defense was organized in three lines in depth. The units on the sea front were to break up the landing forces and conduct a delaying action as far as the first line of defense, which extended in a southeasterly direction through Salon, Aubagne, Cuers, Gonfaron, Grasse, and Saint-Martin du Var.

The Germans had reinforced their formation with a system of submarine and land mines, with beach obstacles, and an extremely dense screen of automatic weapon, mortar, and artillery fire on those portions of the coast that lent themselves to a possible landing. The ports were blocked and mined, the wharves rendered useless, and the majority of the cities and towns were organized as centers of resistance.

In short, the Mediterranean wall was solid and difficult to breach, and it would be necessary to demolish it, take advantage of surprise, and operate in a daring manner to disorganize the defense.

The German plan had not foreseen our action and the landing was to take place at the exact spot where General Wiese did not expect it. The Commander of the 19th Army would thus find himself pressed for time, his reserves would not be able to act efficiently, and his counterattack would be executed by battalions that would be engaged in action from the very moment of their arrival and in a state of considerable disorganization. General Weise, powerless to fulfill his mission, incapable of reestablishing the situation, would find himself obliged to reassemble decimated divisions into combat groups, and to withdraw to the line: Orange—Avignon.

The Landing

In order to understand the pursuit of the German Army, which was beaten from the very outset, let us examine the development of the first engagements. These formed the first phase of the campaign which, in a year's time, carried us to the gates of the Vosges and, considered as a whole, constituted the battle of Provence. The two other phases were to be: exploitation in the direction of the Rhône, and the battle of Burgandy.

On 15 August, under the anticipated conditions, the first troops of the Army set foot on French soil. During the night, the commandos left the *Prince David*, descended into the landing barges, and headed north. As land was approached, the convoy slowed down and the sound of its motors was barely perceptible. Suddenly the beaches were lighted up and flares curved downward toward the sea. Machine guns rattled—the fire plan was in operation. Under the hail of bullets and amidst the bursting shells, the commandos drew near to the Canadel beach and in less than ten minutes the men had penetrated into a woods. The Colonel headed toward the Biscarre ridge where he had planned to locate his first command post and from whence a view could be had of the coast from Cavalaire to Cavalière.

When daylight arrived, the commandos already possessed a bridgehead ten kilometers wide and extending fifteen kilometers inland. They had taken a considerable number of prisoners.

At 0800 on 16 August, the landing of the French divisions began between Saint-Tropez and Sainte-Maxime. The area then became the scene of great activity. Bays were changed to ports, hundreds of boats unloaded a continuous flood of men and matériel, food and ammunition depots were established, roads were congested with traffic, and screening aviation circled in the skies while the artillery of the French and Allied fleets demolished the enemy pillboxes.

First Engagements

The first elements of the 1st Motorized Infantry Division, unloaded from the *Sobiesky* at 2000 at Cavalaire, and those of the 3d Algerian Infantry Division at Saint-Tropez at about the same time. The enemy reacted with a violent air attack.

The fighting began early in the morning. The enemy front was broken, its defense disorganized and our advance gained speed. By the evening of 18 August our forces were pushing forward on the schedule that had been planned. The General in command of the Army modified his original plan and without waiting for all his forces to land, decided to push boldly ahead against Toulon and attempt to take the city by surprise. A report which he received informed him that the main defense of the city was organized facing the west, and that the enemy was now shifting troops in order to organize it facing the east. General de Lattre judged, then, that he had forty-eight hours in which to play his hand with the least loss. He gave his orders accordingly: to attack Toulon and to push simultaneously in the direction of Marseille. He was to attempt to take both cities at the same time.

The Capture of Toulon and Marseille

By the evening of the 21st, the city of Toulon was completely blockaded. On the 22d, Hyères was taken; on the 23d, a detachment of the 3d Algerian Infantry Division pushed into the Saint-Roche quarter and seized the Naval Headquarters. Finally, on the 26th, Toulon was entirely cleared of the enemy and on the 27th, 2500 Germans, including the Admiral who had been in command of the defenses of the city, surrendered, but the enemy was still holding out on the Saint-Mandrier peninsula.

Meanwhile, the battle of Marseille was also developing favorably.

On the 21st, the defense of Aubagne gave way, opening the door through which our forces poured to liberate the city.

On the 26th, Notre-Dame de la Garde, excellent observation post and important strongpoint was taken. At 1650 on the 27th, the white flag was raised over Fort Saint-Nicholas and the Germans requested a suspension of hostilities during the night for the purpose of discussing surrender, and on the morning of the 28th the garrison laid down its arms.

Our troops took 15,000 prisoners, including two generals and several colonels. In comparison with these figures, our own losses were fairly insignificant. Several hundred members of the Free French Forces had been killed in the battle, however, inside the city, where they had greatly aided the regular forces.

Tactical Air Support

Digested at the Command and Staff College from an article by Major H. G. Rice in "The Aeroplane" (Great Britain) 25 January 1946.

ONE hot day in the Western Desert several years ago a senior Army officer walked into a reconnaissance squadron's operations tent carrying a large suitcase. He was wanted urgently at headquarters, he told the harassed duty officer, and could he have a seat to Cairo in the next Hurricane going down?

Somewhere about the same time, in the course of a localized scrap between some Italian tanks and a few of our own tank force, the Army is said to have answered an offer of RAF assistance with the classic signal, "No thanks; we'll fight it out tank for tank." One hopes that this story, and others like it, at the expense of the RAF are apocryphal; nevertheless, these anecdotes of the earlier days of Army-RAF cooperation serve to emphasize the tremendous progress that had been made by the time the last Hawker Typhoon rocket was fired in operations in Germany, and the last Hawker Hurribomber mission landed back at base in Burma. The purpose of this article is to say something of the story of this development from

the Army point of view; how we have learned by experience the difficulties and also the capabilities of the Royal Air Force, and how they—no less important—have learned ours.

To achieve this, many major problems had to be tackled, and in the first two years of the Western Desert campaign the two Services made numerous experiments in the technique of combining land and air forces.

The main task during the experimental period in Africa was to develop some means of producing air support rapidly, so that the leading troops, meeting sudden opposition with which they could not deal, would not have to wait a minute longer than necessary before some aircraft arrived to help them.

Ground and Air Commanders had established beyond argument that the great flexibility of the air weapon could only be used effectively if control of air operations over an entire front was centralized under one command. This made possible the swinging of a great weight of air effort rapidly from one part of the battle to another, instead of dissipating it in penny packets into smaller sectors, where one group of aircraft would be standing idle while another was overworked. But centralization might mean delay; from the front line to the combined Army-RAF Headquarters is often a long way.

To overcome this difficulty a special wireless unit was evolved. A nerve-center of air support communications is now always set up at the combined headquarters in wireless touch with specially trained operators who are strung out along the battle front and work under the orders of the officer commanding each sector of the line. They work in small wireless trucks and are officially and aptly known as "tentacles." Other tentacles are sent to the airdromes from which the supporting aircraft operate, and the wireless octopus thus created enables the Commanding Officer at the front to pass messages rapidly back to the airdromes with only one intermediate stage—the control room at combined headquarters. There the requests for Typhoons, air reconnaissance, and all the other forms of tactical support, are examined by experienced staff officers of both Services, and accepted or rejected according to the policy for the day which has been laid down by the Army Commander and the RAF Commander.

Each tentacle has a crew of four, with a corporal in charge. They operate far from their parent unit and are often moved rapidly about the front as the emphasis of the battle shifts from sector to sector. They have frequently had to show a great deal of initiative, and have built up a reputation for "always getting through." They have many times provided the only working wireless link between an army headquarters and some of its fighting units.

A key man on whom the smooth running of air support largely depends is the Air Liaison Officer (ALO). He is a soldier who lives with the RAF squadrons and is trained to interpret the Army's requirements and difficulties to the RAF, and to keep them informed of the Army's activities. He briefs and interrogates the pilots on all close support missions, and passes on to Army headquarters any military information they may bring back. His job is a responsible one, and ALOs deserve a large share of the credit for the creation of the present happy relations between the Services. The same battle which means shelling, foxholes, and a restricted world a hundred yards square to the fighting soldier is bound to produce different problems, different fears, and different opinions in the mind of the airman, who fights in another dimension. Yet both have the same objective: the destruction of the enemy. The views of both may be perfectly reasonable, yet they need a link which will mould ideas born of different environment into one cohesive policy. That is the job of the ALO.

Many of the targets the Army asks the RAF to attack are extremely difficult to identify from the air. In the desert, a dry river bed full of German motor transport looked like another bed a few miles away which might have been full of British vehicles. In Burma, enemy posts were invariably completely hidden in the jungle and pilots could only bomb the spot which they had been

briefed to attack, regardless of what could be seen there. Therefore the Army has always had to provide as much navigational assistance as possible both to ensure that bombs are not wasted and to avoid disastrous mistakes. In Sicily, a notoriously difficult country for map-reading, bombs were once reported to have been dropped by British fighters behind the same Eighth Army unit on three successive days. On the fourth day, says the legend, North American Mitchells dropped leaflets in German calling on the exasperated victims to surrender.

The Army has devised many ingenious artificial landmarks to assist the pilots, each suited to the local terrain.

With such aids, and thanks to the increasing skill of the pilots, all support in Africa reached a very high standard. Despite the rapidity of the advance the RAF was never outdistanced, and with experience, and the growth of mutual confidence, the fighter-bombers and light bombers attacked targets ever closer to our own troops.

The first direct communication between close support aircraft and troops engaged in a battle came about by accident. In March, 1943, British tanks with the New Zealand Corps were leading a secret march behind the Matmata hills to outflank the Mareth Line. As they approached the "Gabes Gap," a commanding officer, trying to give orders to his tank squadron by wireless, was interrupted by a strange voice saying "Blue leader, can you see those tanks down there? Are they ours?" The tank officer shouted testily into his microphone, "Yes, they are ours. Get off our frequency; we're trying to fight a battle." The Australian squadron leader to whom he had spoken muttered to himself but said no more, and the tank commander continued with his orders. A few minutes later the Kittyhawk leader noticed some enemy guns waiting in the path of our armor. He butted in again "Hi, soldier watch out! There are a couple of eighty-eights dug in behind that crest you're coming up to." Although neither of them realized it, a big step forward had been taken.

In the closing stages of the Tunisian campaign some attempts were made to communicate with aircraft taking part in pre-arranged bombing and strafing as part of the air support for major ground attacks. No real success was gained, however, until the closing stages of the Sicilian campaign, when a wireless set suitable for talking to fighter-bombers was installed in an armored tentacle truck.

This special tentacle, manned by an RAF controller and an ALO was sent out to rove over the front, perching precariously on Sicilian mountain crags to get a good view of the battlefield. It was known as Rover David, after its first controller, and conducted a number of attacks on small targets which were described to the pilots as they circled overhead. The procedure was developed further in Italy, where the topography was often ideal for obtaining an almost bird's-eye view of the enemy lines. In England, during the months of planning before the landings in Normandy, Typhoon squadrons, ALOs and Army units worked intensively to improve the Rover system. As a result, two Visual Control Posts (VCP) landed in Normandy on D plus four. The VCP had wireless sets to speak to fighter-bombers, to the airdromes and to the Army staff and RAF controllers at the combined headquarters. All these sets were installed in an armored half-tracked vehicle, or, for working with armored divisions, in a Sherman tank. The VCPs were intended to be employed only when a local battle of exceptional intensity justified the temporary decentralization of some of the aircraft responsible for supporting a larger front. On other parts of the front normal tentacles would continue to draw on the central pool of air effort.

The "cab-rank" in which small formations of fighter-bombers were sent off at fixed intervals of perhaps twenty or forty minutes to report to the VCP was developed in Italy and continued in Normandy. It greatly reduced the time taken to answer calls for support. In the desert, at least an hour and a quarter was required before fighters could reach a target. With Rover David or a VCP in operation, fighters could be called from an

airdrome and briefed on the way to the area, reducing the time required to about thirty minutes. Quickest of all, with a cab-rank overhead, attacks could be made on a strongpoint located by the nearest soldiers only five minutes before.

The bocage country of Normandy, with high impenetrable hedges and deep lanes, was an infantryman's nightmare. It also made it clear that the term "Visual Control Post" was a misnomer. To position the VCP in the Italian manner so that the target could be observed was not often possible, and the vehicle was usually withdrawn a thousand yards or so from the front line and set up the aerials alongside a brigade or battalion headquarters. Descriptions of the targets were then sent by wireless from the leading troops, and the ALO and controller translated them as quickly as before into language which the pilots would understand. This remained the basis of the system in Europe. The VCPs were renamed, and as "contact cars" they handled strike and reconnaissance aircraft in every phase of the operations until VE-day.

"Armed recce" is the term applied to the fighter and fighter-bomber missions which sweep deep into enemy territory to seek out and destroy his road, rail and water traffic. It is considered by some the most important of all forms of tactical support because of the restriction it places upon enemy movement.

Every soldier realizes that a petrol lorry destroyed a hundred miles from the front today may well affect his own personal battle tomorrow. A German artillery regiment left the Rhine in June 1944, with sixteen antitank guns, thanks to armed reconnaissance it reached Normandy with only two. A captured German report on conditions in France at this time says: "Enemy reconnaissance detects our every movement, every concentration, every weapon, and immediately after detection smashes every one of these objectives. Generally, assembly areas can be reached only at night, but the enemy will illuminate the sky with innumerable parachute flares and our marches must often be interrupted. We must freeze instantly and remain motionless. The best means of locomotion is the bicycle."

The story of the development of close support by Bomber Command, of amphibious tentacles, and of the work of fighter-bombers operating from aircraft carriers would each require a separate article. But the growth of inter-service understanding in each of them has been of the same order as in the Tactical Air Forces. ALOs and controllers have worked together in practically every circumstance of war; in jeeps, on mules, in tanks, in landing craft, in assault carriers and in gliders. Unthinking protagonists of their own service will always maintain that theirs is the most vital contribution to successful operations. The War has ended however, by the cooperation of all.

The great patriotic war introduced many innovations into the art of war. Fighting experience gained on battlefields is a rich treasure for training and educating troops. Therefore the entire training of the Army is to be based on the skillful use of experience of the past war. This experience should also be thoroughly utilized for the theoretical education of officers' cadres and for further advancement of military science. It should be remembered that the art of war makes rapid and continuous progress.

Generalissimo Josef Stalin

Soviet Tactics in the East Prussian Campaign

Translated and digested at the Command and Staff College from a Russian article by Colonel P. Boldyrev in "Krasnaia Zvezda" (Red Star) 9 April 1946.

EAST Prussia was, for a long time, one of the strongest citadels of the German Reich, a strategic bastion of northeastern Germany, and hence, a jumping-off area for the invasion of the Soviet Union or Poland. The same area, if necessary, could be used as a defensive redoubt and as a base for counterblows from the north against the adversary advancing westward through Poland. For this reason, during several decades preceding this war, the German Command was systematically engaged in fortifying the region.

Having lost the battle of Stalingrad, the Germans again began fortifying East Prussia. They built a number of new defense lines; dug numerous antitank ditches; installed thousands of steel and concrete antitank obstacles, and a dense net of wire entanglements and mine fields. Gumbinnen, Insterburg, Tilsit, Koenigsberg, and other cities were transformed into formidable centers of resistance. The Koenigsberg fortress was ringed by three continuous belts of defenses, containing twenty-four forts and a great number of other steel and concrete works. To defend East Prussia, Hitler chose his best armies. The region was defended by the Second, Third and Fourth Panzer Armies, which included about forty infantry divisions, a number of tank and motorized divisions, a formidable array of artillery, mortar units, and various specialized battalions.

The defeat of the German forces in East Prussia was somewhat accelerated by the strategically important operation of our troops in White Russia in the summer of 1944. The Red Army routed the main forces of the central group of the German armies and, skilfully pursuing the enemy, emerged at the East-Prussian frontier with an advantageous operational disposition of its forces. Hanging, as it were, over the flanks of the retiring enemy, the First Baltic Army Group and the Second and Third White-Russian Groups enveloped the East-Prussian forces from the north, along the Nieman, from the east, and along the Narew River form the southeast, thus placing the defending enemy, right at the start, into a strategically disadvantageous position. This maneuver of the Red Army predetermined, to a great extent, the plan of the impending offensive.

The High Command of the Red Army organized this campaign on the basis of cooperation and coordination between two army groups. The main purpose of the plan was to cut off East Prussia and all its defenders from the rest of Germany; to encircle and split them with a deep frontal blow from the east in the general direction of Koenigsberg; and finally, break these forces into several groups and destroy them one by one. Accordingly, the Third White-Russian Army Group, commanded by General Cherniakhovsky, was to launch a frontal attack on Koenigsberg to the north of the Mazurian lakes, while the Second Army Group, under Marshal Rokossovsky, was to strike along the southern border of East Prussia, bypassing the lakes and the most important fortifications from the south and moving in the general direction of Marienburg.

A successful completion of this strategic operation would result in the destruction of the entire northern strategic wing of the German front. The enemy would be deprived of his main strategic bases in the east; our troops would reach the shortest route for the envelopment of Berlin from the north; and would secure the advance of our forces in the most important Warsaw—Poznan direction.

Inasmuch as the defenses in East Prussia were strong and deeply echeloned, it was decided to use several narrow breakthrough sectors. This facilitated the concentration, in the breakthrough sectors, of units and matériel, and deep echelonment, necessary for breaching this type of defense. The plan also called for an immediate widening of

breakthroughs by special forces trained and organized for this purpose.

It should be noted that the conditions under which the two army groups had to operate were different. The Third White-Russian Army Group was to rout a large Tilsit-Insterburg German force, to overcome a series of defense belts, and to capture Koenigsberg, while the Second White-Russian Army Group was to accomplish a deep enveloping movement in order to reach the mouth of the Vistula in the shortest possible time.

The Second White-Russian Army Group was the stronger of the two, and was composed, for the most part, of self-propelled artillery and large mobile units. The Third White-Russian Army Group—its zone of action was limited—was deeply echeloned and was well supplied with artillery. It had more mortar units and infantry-support tanks.

On 13 January 1945, the troops of the Third Army Group launched their offensive. In spite of the stubborn resistance of the enemy backed by his centers of resistance, permanent fortifications, and trenches, our troops broke through after a series of fierce battles. They reached the Inster River north of Insterburg on 18 January, and on 22 January the troops under Colonel-General Galitskii attacked the city from the flanks and rear, captured it, and annihilated its entire garrison.

The Second White-Russian Army Group attacked on 14 January. After two days of difficult action, it also broke through the German defenses and, exploiting this success, began attacking northwest and west. Rokossovsky committed his mobile groups. On 17 January Tsehanuff was captured, and 19 January, the fortified locality of Mlava capitulated. Routed German units were now retreating in disorder toward the Baltic and the Vistula. On 20 January, the tanks of Colonel-General Galitskii took Naidenburg, broke through to the sea, and captured, together with the infantry, the city of Tolkemit.

Thus, the mission of the Second White-Russian Army Group was accomplished: it had cut the routes of retreat to the west for all the German forces in East Prussia. In doing so, our mobile troops and infantry moved forward bypassing and blocking the enemy defending his centers of resistance and strongpoints. The destruction of these groups was effected by second and subsequent echelons. All through the battle, tanks, aircraft, and infantry acted in close cooperation with one another. Our mobile units pursued the enemy without a letup, appeared suddenly on the routes of his retreat, and inflicted heavy losses on the Germans.

Their attempt to break out of the encirclement toward the Vistula did not succeed. The Second White-Russian Group, upon reaching the sea with its right wing, turned east and securely locked the Germans in East Prussia. Simultaneously, the left wing of the group approached the Vistula on a broad front, thus preventing the Germans from undertaking any operations for the relief of the encircled troops.

On 29 January, in a fast advance to the west, the Third White-Russian Army Group completed the encirclement of the fortress of Koenigsberg. All sea communications with Germany were under uninterrupted and effective attacks of our air forces.

Upon blocking all routes of retreat from Prussia, our troops launched strong and simultaneous offensives from the Pregel River to the south and to the north, and compressed the enemy into three isolated areas located at a considerable distance from each other. These centers were Zemland, Koenigsberg, and Heilsberg.

To avoid scattering our forces, it was decided to destroy each of the encircled groups consecutively. The first operation was against the Heilsberg German group. It consisted of about twenty infantry divisions and a great number of tanks and artillery.

Marshal Vasilevsky, who succeeded Marshal Cherniakhovsky as commander of the Third White-Russian Army Group, ordered his troops to dismember the enemy forces by strong attacks from the east and south. To prevent the Germans from evacuating their

units by sea, one infantry and one tank division were directed to advance along the coast of Frisch Gaff. Large forces of artillery and aviation participated in this operation. In spite of bad roads and continuous rain and fog, our troops broke the resistance of the enemy and completed the encirclement of the entire group. From 13 to 29 March, the enemy lost over 50,000 taken prisoner, about 80,000 killed, 605 tanks, and 3,500 field guns.

The difficulty of warfare in East Prussia was complicated by the fact that all the encircled groups were far from each other. This compelled us to go through difficult regrouping of our forces to prepare for each of the operations, and to train our troops for the specific tasks involved in their missions.

Thus, while the Heilsberg operation was in full swing, General Bagramian was preparing for the storming of Koenigsberg. To this sector were moving the units relieved by the termination of our activities in the south. These forces immediately occupied the sectors assigned to them in the plan for the impending operation. So did the newly arriving tank and artillery units. All these forces began preparing for the assault. They were trained in the methods of overcoming permanent fortifications, street fighting, etc. Coordination and cooperation measures were worked out, and the hostile defenses carefully studied. Owing to this, the troops of the Third White-Russian Army Group had been completely ready for this new and complicated operation long before the final destruction of the southwestern German group.

Koenigsberg was defended by the best German troops. But against the enemy there stood a concentration of thousands of guns, tanks, and other types of weapons in full battle readiness. Marshal Vasilevsky used the tactics of dismembering and piecemeal destruction of the enemy. In accordance with this idea, General Beloborodov was to strike from the northwest, General Galitskii, from the south. They were to split the enemy garrison in two and join forces in the center of the city. From the north, the attack was to be made by the troops of General Ozerov, and from the west, by part of the units of General Liudnikov. These troops were to split the defenders in the eastern and western parts of the city. Our air forces and artillery were to destroy the personnel and the matériel by massed fires and aerial bombing. Considerable importance was given to the destruction of German personnel and matériel attached to specially trained assault battalions, tank units, and separate tanks which were supporting the infantry in fighting in the streets of the city.

On 8 April, following the breakthrough of the outer defensive belt, the Soviet troops approached the outskirts of the city. Large forces of our aircraft subjected the city to an intensive bombing. The German garrison suffered heavy losses, but resisted stubbornly. General Beloborodov's and General Galitskii's units, capturing one strongpoint after another, joined forces in the center of the city on the day the attack was begun, thus completely splitting its garrison.

The Germans withdrew to the eastern part of the city and attempted to reorganize their defense. But our troops continued to press on all through the night and narrowed the ring of encirclement. Faced with disaster, the commandant of the fortress ordered the garrison to capitulate.

Soon after the fall of Koenigsberg, the third German group was also destroyed. On 25 April, the last German stronghold, the city and port of Pillau, was seized by our troops.

Modern Aircraft Carriers

Translated and digested at the Command and Staff College from an article in Spanish by Lieutenant Commander Ignacio Martel in "Revista General de Marina" (Spain) December 1945.

BATTLESHIP-CARRIERS, or carrier-battleships; which are they? To answer this we must first determine what an aircraft carrier is, for upon this the whole question hinges. If one says that an aircraft carrier is a vessel transporting planes, one must remember that any battleship, cruiser or even a submarine may also transport aircraft. Whether the planes land on deck or are hoisted out of the water does not establish a valid, specific difference. The airplane is the principal weapon of this type of vessel, but if this is what determines its name, destroyers (and at times cruisers and even battleships) should be called torpedo-carriers; mine-layers should be known as mine-carriers; and battleships generally as gun-carriers due to the guns which they carry in greater number than any other ship, thus indicating the main weapon of each. The name aircraft carrier, however, has been adopted by all the navies of the world, and not without reason in view of the origin and genealogy of these ships.

The carrier was a new weapon requiring definition, and the one hit upon was fully accurate. Nonetheless it now needs defining once more. Without foregoing the professional tone which is so in vogue nowadays in the matter of definitions, we shall say that the aircraft carrier is a "floating airdrome whose planes cooperate in the various missions of the fleet." This definition suggests immediately that what may have been a generally accepted concept a short time ago is now outmoded. Under it, the aircraft carrier is not expected to fight; its role is solely that of transporting planes to the scene of battle and making their intervention possible. Can the aircraft carrier logically be condemned to this eternal role? We do not know the answer, nor shall we attempt to find it.

If we simply view the matter in the positive light of what took place in the recent campaign in the Pacific, we meet with the fact that the aircraft carrier has won for itself, beyond cavil, the right to be regarded as a warship in the fullest sense of the word, without any of the restrictions formerly placed upon it. Studying the events in that campaign, we find them to be the effect of a cause which is in turn a variation of a general principal. Strategically that cause is unchanging in its essence though it may vary in form. No one can deny the existence of that coordination of action upon which the principle is based.

The action by the independent task forces, which carried the battle to whatever place strategy might require, not as a further development of an already existing control of the sea but rather establishing it in new areas, is quite different from that which we had in the past and reveals a variation of the principle.

The mission of these task forces required their being given great power together with a composition differing from traditional standards in accordance with foreseeable contingencies, so that they could defend themselves against attack from any direction and have sufficient power to undertake isolated action.* Judging by the carriers used by the American Navy in the Pacific campaign, the warfare waged in that campaign, and the general knowledge we have on the subject, we believe that the aircraft carrier has ceased to be an "intermediate" vessel whose mission could be taken over by other ships.

In summary, the new CVB's possess all the qualities which are sought in a battleship. We may wish to differentiate between those battleships whose principal weapon is a gun and those whose main weapon is an airplane, but we must never lose sight of the fact that the aircraft carrier is a fighting ship, a ship engaging in battle.

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* These task forces will comprise light and heavy cruisers as well as aircraft carriers. That is to say, task forces wherein the aircraft carrier is not a special ship but one more vessel which will fight just like the others, with its main weapon, which is of course the airplane, but with the same effectiveness as any other ship.

British Rockets in the World War

Digested at the Command and Staff College from an article by Brigadier A. F. S. Napier in "The Journal of the Royal Artillery," January 1946.

THERE can be no doubt that the development of the rocket, leading up to the flying bombs and guided rockets, introduced by the Germans at the end of the war, has been one of the outstanding achievements of the past ten years. Though the Germans may appear to be a long way ahead of other nations in the application of rockets, it can be fairly said that they were in no way ahead in thought.

In December 1934, Master General of Ordnance, called a meeting at the War Office to "Review our present knowledge of rockets in general." It was known that the Germans had already made considerable progress in rocket design, and it seemed probable that other nations were also engaged in the same investigation. In July 1936, it was decided that rocket investigation should have the following aims, in order of priority: (1) Antiaircraft artillery defense. (2) Long range offensive. (3) An aircraft weapon against hostile formations. (4) Assisted take-off of heavily loaded airplanes.

In the interests of secrecy it was decided to call the rocket investigation "P.D." (projectile development), and the rocket "U.P." (unrotated projectile), and the experimental establishment for rockets became "P.D.E." (Projectile Development Establishment).

Owing to the high priority of antiaircraft artillery defense, the whole effort on rocket research was primarily directed towards the successful development of a rocket for this purpose. By the beginning of the war, in September 1939, sufficient trials had been carried out for an estimate to be made on the capabilities of the rocket in antiaircraft artillery defense. Projector design and fire control were still, however, incomplete and no user trials had been carried out.

The design of 3-inch rocket proposed had a total weight of about fifty-four pounds and was just over six feet long. It carried an HE shell of normal design. The fuze was the conventional type of powder time fuze, except that it was armed by air pressure through the nose; the absence of spin and the small accelerating force precluded the usual safety devices. Ignition was obtained by an electrically fired igniter, the current being provided through contacts on the base of the rocket motor corresponding to other contacts on the projector.

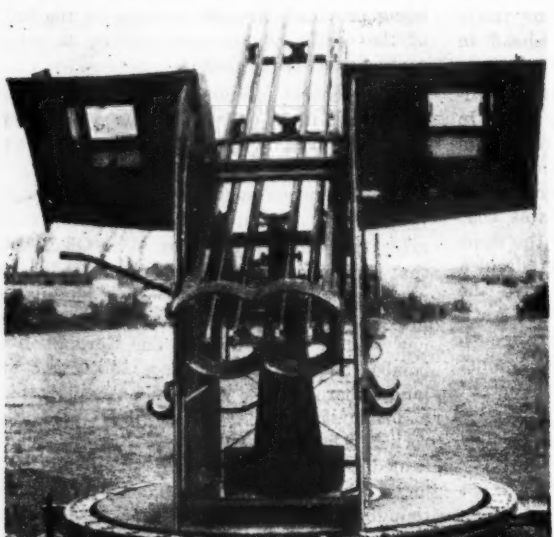
The general design of this rocket has undergone little alteration during the war. The main improvements have been in the charge and the fuze.

Minor improvements in design and trials for ballistic data and lethal effect continued after the war started. The War Office felt that it would be premature to introduce a new weapon until it had been exhaustively proved at trials. However, by early 1940, a new situation had arisen. The German dive bomber had become a menace at sea and on land. There was a very good promise that a proximity fuze could be used with the rocket. The photo-electric (P.E.) fuze contained a photo-electric cell which operated on a change of light conditions. It was thought that the use of this fuze would provide a formidable weapon for the close defense of ships, ports, factories, etc.

In May, 1940, a directive had been received from the War Cabinet, that rocket weapons should be introduced, forthwith, for the protection of ships, aircraft factories and other points of exceptional importance. The two main problems were projectors and fuzes. It was decided that multiple barrel projectors, to fire 3-inch rockets with P.E. fuze, should be designed and built for installing in capital ships; concurrently smaller multiple projectors to fire 2-inch rockets with D.A. fuze, should be installed in destroyers. For the land role it was decided to design and build single barrel projectors. There were two reasons for this decision; as it would be

difficult to anticipate the exact point to be attacked it was considered preferable to dispose a large number of single rather than a small number of multiple projectors; the single barrel projectors would be simple and quickly constructed and would give a better chance of completion in the numbers and time required, i.e., 2,500 within six weeks.

By 1941 the tactical situation had again altered. Dive bombing against ships had changed to low level attacks taking place, mainly, at dawn and dusk; the similar menace against land targets, in Great Britain, had been disposed of by the RAF. The Germans were now attacking our towns and factories with heavy bombers at night. The rocket weapon, therefore, reverted to the role originally intended for it, that of supplementing the heavy gun defense. There was another contributory factor, the P.E. fuze was useless at night or in half light and for this reason was discarded both by the Army and the Navy. The Navy adhered to the smaller 2-inch weapon, which was more suitable for small ships and merchant vessels, and discarded the 3-inch altogether.



A.A. Projector Rocket, 3-inch, No. 2, Mark 1. (Twin Barrel).

The single projectors were later replaced by a much better design of twin projector, more robust and embodying all the improvements suggested by operational practice. (See figure). In addition, one hundred 3-inch antiaircraft artillery gun mountings were converted to take nine barrel projectors and were formed into eight semi-mobile batteries. Two of these batteries and one twin battery subsequently went to North Africa where they were employed in defense of ports.

It is difficult to assess the true value of the rocket as an antiaircraft artillery weapon in the high angle role. The number of rockets fired were few compared with the number of 3.7-inch shell, and where aircraft were brought down it was usually difficult to determine which particular battery was responsible. The accuracy of the gun is, of course, much greater; against this can be placed the effect of a large salvo of rockets. The best target for the rocket salvo should be aircraft flying in large formations, and, as far as I know, no such target was ever encountered by the rockets.

One of the most outstanding developments has undoubtedly been the employment of rockets from aircraft against submarines, ships, and land targets.

As early as 1940 some consideration was given to the use of rockets from aircraft and in July, 1941, the Ordnance Board suggested that attention might be paid to the possible use of rockets from aircraft against tanks. It was known by August 1941, that the Russians were using rockets in this way, fired from fighter aircraft, and General Mason MacFarlane was given a demonstra-

tion of their use in Russia. It was decided to start trials using the 3-inch antiaircraft artillery rocket, fired from beneath the wing of a Hurricane aircraft. The first trial to test the projector equipment and general functioning of the rocket was carried out with a Hurricane aircraft in October 1941.

In December 1941, the suggestion was made that this weapon might also be used against submarines, at that time, a target of greater importance than tanks, and presenting a much larger lateral surface. The first aim was the attack of such ships above the water line, i.e., submarines would only be attacked when surfaced. It was however, recognized that the most effective method of attack would be below the water line for merchant ships and against submarines submerged to a depth of at least fifty feet, and it was decided therefore as a longer term policy to carry out research into the underwater trajectories of rockets.

It has been found possible to mount eight rockets, four on each side, on the under side of a Hurricane wing. They were suspended by single rails and fired forward in the direction of flight of the aircraft, thereby gaining additional velocity due to the aircraft speed. It was found to be a simple matter to protect the aircraft against fire, and the trajectory at 400 yards range was sufficiently flat to make an exact estimate of range unnecessary. Because the accuracy was not considered good enough, particularly against a moving target, and because of the vulnerability of aircraft in this form of attack, the weapon was not, at that time, accepted in the antitank role, and interest shifted to the antisubmarine and antiship employment.

In December 1942, a comprehensive report was issued by the Air Ministry on the possibilities of antisubmarine attack. It was concluded, in the words of the report, that the "Hudson aircraft is capable of making very accurate and devastating attacks on the U-boats." The weapon was therefore accepted in the Fleet Air Arm. But the factor which eventually contributed mostly to the success of the 3-inch rocket against submarines was the discovery that this rocket had a very good underwater trajectory. It was found to continue along the same path through the water, eventually curving upwards, and to be effective against submarines below the surface. Subsequently, rocket firing aircraft were tried out against land targets, in the battle of Normandy, with very successful results. Fired from Typhoon aircraft, rockets did considerable damage against light defenses and vehicles, and even against tanks. Although perforation of tank armor was not possible with an ordinary HE shell, the aircraft was able to attack the tank from any direction and against the most vulnerable parts.

The rocket firing aircraft was quickly adopted by the American Army as a result of the successful results obtained by the British. At first they were supplied with our 3-inch rocket; now they have evolved designs of their own. There is scope for considerable improvement in this weapon, larger rockets carrying heavier heads can be used; this will necessitate better methods of range determination since the larger rockets, fired possibly from longer ranges have a more curved trajectory introducing considerable errors due to gravity drop.

Another useful employment of rockets in this war, and one which has led to much controversy, is the firing of large salvos carrying shell, equivalent in effect to medium artillery, from very light and easily constructed multi-barrel weapons. It is a curious turn of events that this weapon, which started life as a special weapon for the army, and at one stage was practically abandoned, was subsequently adopted by the navy for firing HE barrages during landing operations, and has now returned to the army as a suitable weapon for drenching an area with medium HE shell.

In September 1942, a meeting had been held at Combined Operations Headquarters to discuss the lessons of the Dieppe raid. The main conclusion of that meeting was that the beaches and the land overlooking the beaches must be drenched with the maximum amount of HE shell that could be made available immediately before the landing took

place. Experience had shown that, in spite of the greatest care and preparation in the identification of enemy batteries and machine guns, and in the organization of aimed fire from naval guns or aircraft, many of the enemy's weapons would be unlocated. The dust and smoke of battle, would make it difficult to engage these targets after the attack had been launched. The proposal was made that special craft should be fitted out with a large number of 5-inch rocket projectors capable of drenching an area with medium weight HE shell during the immediate period before the landing took place.

As a result of this discussion the Admiralty, in November 1942, stated a requirement for the development of a rocket equipment, to be mounted on a LCT(R) to deliver a high concentration of HE in the vicinity of a landing beach. The army sextuple projectors were adapted for fitting into the LCT(R), and it was found that the number that could be installed would enable about 800 to 1,000 rockets to be fired in under forty-five seconds. The equipment was known as the "Mattress."

In March 1944, the employment of a rocket projector consisting of a number of spiral railed barrels, mounted on a lorry trailer, or self-propelled vehicle, to fire a heavy concentration of 5-inch rocket heads, was suggested. The idea was developed and it was proposed that the aircraft 3-inch tail should be used on the naval twenty-nine pound HE shell, as used in the sea mattress, which would give the rocket a maximum range of 8,000 yards. It was realized that, unlike the sea mattress, variable range would be required; at low angles of elevation the range dispersion is very great so a new method of varying range was devised; this consisted in placing over the nose of the shell flat discs of varying diameter known as spoilers; these have the effect of increasing air resistance and so reducing range without changing the range dispersion obtainable at high angles of elevation. The equipment was called the "land mattress."

The first pilot projector was built in May 1944, and consisted of thirty-two spiral rail barrels mounted on a 20 quintal (general service) trailer. The equipment had to be regarded as experimental because a safe fuze, suitable for land operations, had yet to be designed.

Another use of the rocket was the "assisted take-off of airplanes." The satisfaction of this requirement by rockets has proved an important contribution to the war effort.

At the end of 1940 it was decided to experiment with two forms of "assisted take-off" using rockets. One system, known as CRC (Cordite Rocket Catapult) used rockets for driving a trolley, on which the aircraft was carried; in the other system, known as ATO (assisted take-off), the rocket propulsion unit was carried on the aircraft itself, the ATO unit being jettisoned when the aircraft was airborne. The CRC system was the first to be completed and was used with conspicuous success, enabling merchant convoys to send up fast fighter aircraft to combat the approaching enemy bombers. With the introduction of escort carriers, aircraft were flown off the flight deck by means of the ATO system.

What of the future, who knows? Ranges of over 200 miles have been obtained, and the principle of guiding the projectile on to its target by radio is within reach. There seems to be no reason to doubt that ranges of over 500 miles will be obtained before long, and that accuracy will no longer be proportional to range. A strategic weapon will thus be available, entailing no risk of life to the user, which can be directed against the very heart of an enemy.

To expect defeat increases the possibility of being defeated; an army convinced of its superiority doubles its courage and its possibilities of achieving victory.

Le Bon in "Guardia Nacional," Nicaragua

The Art of Command

Translated and digested at the Command and Staff College from an article in Portuguese by Colonel J. B. Magalhaes in "Revista Militar Brasileira" (Brazil), Volume XLI, Numbers 3 and 4

THE importance of command, that necessary function which emerges at the moment when two individuals combine their efforts in order to accomplish a common task, is well known. The same, however, is not true in regard to the *art* of command. Even today, many are unacquainted with it and few recognize its true value. Rare indeed, are the masters of this art in which perfection is undoubtedly the most difficult to attain. It is an art which like any other art is based on skill of a scientific character, but since human nature is its material it is the most complex and difficult to master.

Rare have been the figures throughout history who, like Caesar, Napoleon, Suvorov, and a few other leaders of men, were able to obtain from their men the most complete devotion and extreme sacrifices.

It was only after the tremendous shock of the first World War, when considerable progress was made in the study of this art, that it began to appear in official documents of military institutions as something worthy of special consideration.

The mission of the commander is of much greater scope than is habitually thought. It does not consist of merely issuing orders and checking on their execution. It includes a manifestation of the personality of the commander in everything which concerns preparation for war in time of peace, and its consequent application in combat. In fact, command is organizing his troops in such a manner as to assure their normal functioning at all times. It implies the satisfying of their material needs and preparing them for fulfilling war missions through professional, technical, and tactical training, and always maintaining them in a state of readiness. He must demonstrate a clear understanding of his duties, and set an example of self-denial and sacrifice. And finally he must utilize in combat that knowledge and those virtues which, allied to tact in great leaders, assure victory.

Quality of Leadership

A recent poll among officials in industry, commerce and civil administration, seeking an opinion on what human qualities are necessary in exercising the functions of management, showed the following to be considered the most essential: Intelligence, integrity, courtesy, loyalty, professional knowledge, and health.

By the *majority* of those who have responsibilities of management, *intelligence* is considered the most necessary quality since it must be applied frequently. Subordinates habitually test their superiors in this respect. They like to work under leadership which they consider intelligent.

Professional knowledge while of primary importance to some, is evidently of secondary value to others. Those who argue this, point out that certain leaders, having been charged with the direction of unfamiliar tasks, obtained better results than others who were better acquainted with that field proving, they say, that professional knowledge is not of primary importance.

Integrity of character is judged by all to be a quality as useful as intelligence because it promotes both the respect and admiration of subordinates. Combined with even a moderate intelligence it makes a leader capable of producing good results.

Forcefulness is a quality which exists in some leaders while in others it must be developed. It is a quality which is necessary, especially at critical moments and particularly when there is glaring insubordination among the elements commanded.

Courtesy is of greater importance than it may appear, but it should be impartial. Being courteous does not mean failing to differentiate merit in people. The leader who treats bad and good equally is unjust.

Loyalty is one of the qualities considered most essential by older or experienced leaders. The importance of loyalty is evident, since it is often necessary to accept in good faith something which a subordinate leader says, without being able to examine it further.

All of these qualities are obviously necessary in all leaders, whether they be civilians or military, but in considering the military field, we believe that they are insufficient. Here it is necessary that the leader be able to obtain maximum self-denial and cooperation without reservation from his men, because war engenders a series of violent psychological states which the leader must control in himself and know how to control in his men.

It is a fact that army officers are control elements in the formation of morale, and the strength of an army is measured by the degree of cooperation between superiors and subordinates. This control and direction must be able to overcome the crisis which war engenders by virtue of special psychoses and neuroses, the effects of which are more or less severe in relation to the previously existing psychological state.

Qualities and Behavior of the Military Commander

Of all the conditions which a military commander must fulfill, the first, universally recognized, is that he must *constitute an example* to those who depend upon him. It is under fire that *example* becomes most necessary because it is then not only essential to the effectiveness of his action, but in many cases the *only means* at his disposal with which to influence his subordinates. He may tremble with fear but he will advance, knowing that the small group of men which follows him trembles also—perhaps more than he does—but is watching and following him. He is conscious of this situation. Under fire, he can lead his men only by example.

This applies to subordinate commanders, those who are in direct contact and in leadership of their men in combat. In higher echelons we find that the example of the commanders exerts an even greater influence, though not in such obvious forms.

In order to set an example though, the commander must possess the essential qualities of command, a perfect understanding of his responsibilities, a thorough knowledge of his men and the unit which they comprise, and must know and be capable of exercising all his functions. The commander is all-important. Napoleon summarized the importance of the commander admirably when he said that there are no poor regiments—there are only poor colonels.

Intelligence is without doubt a basic necessary quality. The higher the echelon and the more complex the problem which must be solved, the more important it becomes. We might say that the problems of a subordinate commander are of *immediate character* and that his decisions are exercised within very limited time and space. The time and space elements increase in the higher echelons, reaching highest proportions for those who direct strategic action involving the employment of all the forces of war. Capacity of understanding is therefore not enough for commanders of higher echelons. Above all they must have imagination.

Judgment, in the sense of a proper appreciation of facts, information, and events, characterizes the merit of all commanders, and is of great importance. It varies however with the sphere of action. A commander may have good judgment of tactical situations in a limited field of action and still be incapable of dealing with those of a higher echelon.

Without *integrity of character* no one can inspire confidence in others. This is especially true in regard to subordinates, which is of summary importance because confidence is reciprocal between commanders and subordinates. It is the most effective element in assuring an immutable discipline.

Troops commanded by an intelligent commander who lacks character, may have a good appearance but will lack a *sense of duty* because he is morally incapable of inculcating it.

Character, which certainly presupposes

forcefulness does not rule out *courtesy* however, and it implies a strong sense of justice and fairness and exemplary personal conduct. Its outstanding feature is *sincerity*.

Personal conduct, which in time of peace is the example which the commander sets for his subordinates, also calls for *devotion to duty*. That is to say, that in the exercise of his command an officer must not be engrossed in personal problems such as love, pride, or personal ambitions, as these things distort his character and the character of his noble and difficult mission.

A commander who is infatuated with his own importance or who occupies his post in order to satisfy his own desires or pride, or to become prominent and adorn himself with the glory of his authority, and who as a rule wants only admirers or timid persons around him cannot exercise his functions with dignity. Personal ambition, desire to please, complacency, and timidity are all foreign to his office. He should fear nothing and seek no favors. If he is rewarded for his work, so much the better, but this should never be his principal motive.

The outward manifestations of authority by a commander are natural, calm, courteous and forceful.

The *courtesy* of the commander does not include, however, any flattery for either his superiors or his subordinates. Nor is it to be confused with weakness. Courtesy is an obligation of the commander. Any man can be judged by his manner of greeting, or of addressing himself to a superior or subordinate. Nor is courtesy incompatible with forcefulness, which in itself does not necessarily mean bullying and has nothing to do with arrogance. It does not imply threatening attitudes nor forcibly restraining the undesirable practices of subordinates. The attitude of an officer generally indicates the state of his morale and necessarily influences the state of morale of his subordinates. His manner of issuing an order or of demanding greater effort from a subordinate must be clear and positive but must adapt itself to the mentality and nature of the man. Language which is clear, simple, sober, and sufficient, indicating a clear thought and a firm will, obtains the best results. This can be done without harshness, in good civil form, and without any exaggerated courtesy. The intelligent commander knows how to deal with superiors and subordinates in keeping with the circumstances of his duty and the respective natures of various individuals, without injuring his personality nor shirking his duty.

He must be a man of *tact*.

An order given in an imperious tone of the German style (His Majesty commands!) does not invite the subordinate to take a personal interest in its execution—it merely contains a threat of punishment if the order is not carried out. In such a case there can be no willing voluntary cooperation.

The necessity of being courteous and forceful at the same time, does not mean being vulgar or too familiar, however. It is a grave error to suppose that the rank and file appreciate vulgarity in the commander.

Forcefulness does not exclude the possibility of cheerfulness. This is one of the qualities appreciated in the military commander, and it has a tremendous effect on the morale of those around him. Nor is forcefulness a substitute for tact. The commander who understands his duty as merely executing his authority in relation to his subordinates and its resignation in the presence of superiors exposes himself, and those who placed him in authority, to serious disillusion.

The senior officer must respect the personal feelings of his subordinates even though they do not always satisfy him completely. He must know how to utilize them as they are, using their good qualities and even their defects—which often are nothing more than exaggerations of certain qualities.

Tact makes resistance and opposition disappear. It turns adversaries into allies. The leader who does not have this quality drives away the sympathy of his men, and they will regard him with apprehension, caution, or even hostility.

Tact in dealing with subordinates creates a sense of justice and fairness, without

which the leader will not be truly respected or esteemed.

Fairness creates a feeling of confidence, born of the certainty of impartiality. In case of a conflict among his subordinates, the leader must know how to hear and treat all sides impartially, and convince them that his only object is to be just.

Morale, one of the indexes by which the true merit of a military organization may be gauged, depends to a great extent on the confidence which the leader inspires, and on the certainty that justice and fairness will prevail. Unless there is justice and fairness in giving punishment or rewards, discipline is endangered and morale weakens and may even disappear.

Finally, let us consider the question of *military knowledge*, or professional capacity. Little must be added to what has already been said in regard to leadership of men, in general. This is a necessary quality in the military field, and the higher the sphere of action of the commander the more essential it is. However, it is not enough. It is not knowledge which is important, but the manner in which it is used. Of what value is it to be well grounded in military matters, have a technical knowledge of weapons, tactics of the arms and services, functioning of the general staff, history and strategy; or to be learned in the relationship of war to politics, without having a strong sense of duty and responsibility characterized by exemplary personal conduct and persistent effort?

Of what value is knowledge if it is not applied? A commander who has little imagination, is passive, whose unit does not have an effective training program which is well organized and which does not apply itself systematically under his direction and control, may be a savant but that is not enough to give stability to his troops, nor will it instill in them the habits which will enable them to function efficiently in the field. Of what value is knowledge to a commander who does not love his work?

Undoubtedly the ability to command requires professional knowledge, but only as an auxiliary element. The *art* of command is essential. Knowledge depends primarily on intelligence and memory but knowledge and technical training are of little value to the commander who does not possess, in addition, the ability to lead men and to influence their will in order to coordinate their efforts.

Knowledge is certainly indispensable to a commander, but his ability to observe, consider, make a decision, and then cause his will to be accepted by others, even to impose it if necessary, is an indication of his capacity as a leader.

The simple truth is that some are born leaders of men and others, in spite of their good intentions, will never be able to command well, which increases enormously the tremendous responsibility of those who select or influence the selection of commanders.

Combined Infantry and Tank Attack

Translated and digested at the Command and Staff College from a Russian article by Lieutenant Colonel B. Marvin in "Krasnaia Zvezda" (Red Star) 8 December 1945.

IN close combat, the infantry makes full use of its weapons. When making the main attack, it relies mainly on machine-gun and gun fire of its supporting tanks. As soon as the tanks of the attacking force reach the infantry's line of departure, the latter moves forward keeping behind the tanks. When the tanks reach a line 150 or 200 meters from the first enemy trench, the artillery and mortars shift their fire to the second enemy trench.

At this moment, the tanks of the first echelon open fire on the first trench, on enemy communications trenches, and other targets. At the same time, the infantry's heavy weapons (heavy machine guns, mortars, and direct-laying guns) likewise fire on the first trench, and the infantry, following behind the

tanks, fires as it advances. In this way, the artillery fire on the main line of resistance of the enemy is succeeded, without any delay, by the fire of the tanks and of all infantry weapons.

What happens after this? The first tank echelon follows immediately behind the bursting shells of the artillery. By means of assault fire and the crushing effect of their weight they eliminate the enemy personnel and weapons in the first line of enemy trenches and communication trenches and, without stopping, continue to move ahead toward the second trench.

As a rule, the final mopping up of the enemy in the first trench is the duty of the infantry of the second echelon, which takes the enemy prisoner or annihilates him with the fire of its submachine guns, hand grenades and, though less frequently, with its bayonets. The action of these rifle units is supported by the tanks of the second echelon, the self-propelled guns, and the fire of infantry heavy weapons. At the same time, the tanks and self-propelled artillery of the second echelon support the action of the assault echelon.

By this time, the tanks of the assault echelon have approached to within 150 or 200 meters of the second trench. On a signal from the tankmen, the artillery shifts its fire to the depth of the enemy position. The action of the tanks and infantry are similar here, generally speaking, to that in the capture of the first trench. But if all the infantry weapons take part in the action for the first trench, in fighting for the second trench the rifle units are able to employ only their light automatic weapons, possibly mortars, and some of the heavy machine guns for a large proportion of the heavy infantry weapons (heavy machine guns and organic regimental artillery) are on the move; they lag behind the assault wave and are not able to support the attacking infantry. This compels the infantry assaulting the second trench to rely mainly on the action of the tanks.

Following this, the tanks and infantry rapidly advance for the assault of the third line of trenches. But in this period, even the second echelon may often be sent into action. It reinforces the first echelon in order that the attacking force may more quickly seize the remaining trenches of the position. The third line is laid out in most cases at a distance of from 600 to 1,000 meters from the second. On this account the assault is often preceded by an advance to a point from which the infantry is able to make use of its light automatic weapons. An analysis of the method employed to effect this advance is not within the scope of this article.

Thus, it may be considered that in the opening period of an attack on strongly fortified enemy positions, the sector in which close combat occurs extends to the depth of two trenches located at a distance of from 200 to 400 meters from one another. The beginning of close combat is determined by the moment when the tanks and all the infantry weapons simultaneously open a powerful fire on the main line of resistance and when the tanks and rifle units rush forward together. Later on, this close combat is characterized by the combined action of the tanks and infantry for the destruction of the enemy in the first two trenches. In this action the infantry, as a rule, operates at short range employing the fire of its submachine guns and rifles, and its hand grenades. As regards the tanks, a considerable proportion of them employ not only their machine guns and guns, but also make use of the crushing action of their weight for the destruction of enemy personnel and weapons. Flame-throwing tanks are able to lend great assistance to the infantry in close combat, effectively destroying enemy personnel and weapons in trenches, communication trenches, shelters, and in earth and timber pillboxes.

In this type of fighting, tanks and infantry are organized in small units. It is important to maintain close cooperation between tanks and infantry throughout the entire close-combat action. Cooperation is first set up in regiments and divisions, but it is up to the commanders of lower units to bear the responsibility for carrying it down to the smallest units.

The Navy's Part in the Victory in Europe

Digested at the Command and Staff College from an article by Rear Admiral G. E. Creasy in the "Journal Royal United Service Institution" (Great Britain) February 1946.

THE invasion of Europe was a combined operation carried out under the supreme command of General Eisenhower by the combined forces of the British Commonwealth and the United States.

This history of the operation dates back to the Casablanca Conference of January 1943, when the Combined Chiefs of Staff ordered that plans should be made for the invasion of Europe in May 1944. In fact, administrative planning had been started as far back as May 1942, when a British planning staff began the provision of long term shore facilities of every type stretching from the Wash to Land's End. Casablanca gave us an outline of the military and air forces that would be made available and an allocation of landing ships and landing craft on which we could plan. On this basis a combined British-American planning staff got to work in April 1943.

It is not unfair to say that all the world knew by this time that we were inevitably bound to invade Europe sooner or later. The only unknowns were "Where," "How" and "When." As far as "When" was concerned our orders from the Combined Chiefs gave us the approximate date and the problem before us was to decide "Where" and "How." The choice of the Bay of the Seine as the "Where" was primarily based on the strength of the German defenses. Successful invasion must normally depend on the early seizure of a port through which the vast supplies of a modern army can be passed. This self-evident fact was obvious to the enemy as to ourselves and, wherever suitable ports were to be found, there the enemy coast defenses grew thickest and most powerful.

The Bay of the Seine was relatively ill-defended, primarily because it contained no major port. It was therefore chosen as the point of attack, accepting the fact that the Army would have to be supplied over the open beaches of the Normandy coast for a prolonged period because, even if early military success led to the capture of Cherbourg, this port with its bad land communications down the narrow Cotentin Peninsula could only hope to meet a fraction of the Army's supply problem.

As regards "How," the main problem to be answered was whether to assault by day or to assault by night. A daylight assault was chosen and this decision was based on the belief that the continental beaches were so heavily defended and mined that a night assault would be decimated by blind fire and by beach mining before it had a chance to seize a beachhead. This called not only for great volume of gunfire but for great accuracy, and to achieve this accuracy it was believed that daylight was essential. On the other hand, the assault would have to be so timed that the maximum possible of the approach would be covered by darkness.

It was clear from the start that a night passage with a vast number of ships and craft moving through a limited area would involve many tricky problems. When on top of this they would be launched in a daylight assault to a complicated prearranged program from which no departure could be allowed, it was obvious that a precision of maneuver and skill of seamanship would be required which would call for intensive training. Both British and American landing craft were manned by comparatively amateur sailors and they had to acquire the maximum of training in the time available. For this purpose it was necessary to provide training areas in which the Navy could land the Army supported by the Air Force in conditions as realistic as possible, where gunfire and bombing would take place and within a reasonable distance of the assembly area of the forces.

While things were thus beginning to take shape we had at this time one great difficulty and that was the absence of any decision about the command of the operation. From

naval angle our anxieties were relieved when Admiral Sir Bertram Ramsay was appointed as the Allied Naval Commander in Chief on 25 October 1943, and a further step forward was made shortly after this with the arrival of Rear Admiral Kirk, who was to be the Naval Commander of the Western Task Force under whom would work all the naval forces of the United States taking part in the operation.

From this point our Naval Plans could go forward with assurance, but here again we were faced with the trouble that they were perforce tied to the General Plans, and these were still provisional. To launch the invasion in May we decided that detailed combined planning must start on 15 December and this was actually done even though we suspected that the Military Staff with which we were working would not be that charged with the conduct of the operation, and that no Supreme Commander had yet been nominated. With the end of the year, however, came the end of our troubles and the appointment of General Eisenhower as Supreme Commander, with General Sir Bernard Montgomery as Commander in Chief, 21st Army Group.

The new Command was not slow in voicing objections to the COSSAC [Chief of Staff of the Supreme Allied Command] plan. Briefly the complaint was that the initial blow was being delivered by insufficient forces on a front that was not sufficiently wide and that the capture of Cherbourg earlier than envisaged was essential. So the plan was amended to include an assault by five divisions on a front that now included the base of the Cotentin Peninsula, with the same two tactically-loaded divisions as an immediate follow-up reserve.

It was very obvious that the naval lift at our disposal, which was just adequate to lift five divisions, could not be stretched to lift seven, even if the expedient of cutting down the vehicle strength of divisions was adopted. By postponing the date of the operation by a month we gained an extra month's Anglo-American production of landing craft but even so we could only partially meet our revised needs. The only source from which additional landing craft could be drawn was the Mediterranean, and clearly this would be not only at the expense of current operations in Italy but would also react on the original strategical plan wherein an assault was to be launched on the south coast of France more or less simultaneously with the channel operation.

Such a change of grand strategy had to wait the approval of the Combined Chiefs of Staff which could not be expected quickly. The necessary detailed planning, however, had to start at once and we went ahead on the assumption that half the lift available in the Mediterranean would be allotted to the channel in time for the operation.

We were now faced with the task of assembling and training five assault forces. It was clearly impossible to find any more training areas, so both American forces shared the Slapton area and two British forces shared the Studland area. The final assembly of the five assault forces on the south coast stretched the available berthing and maintenance facilities to the very limit, but everyone was determined to ram a quart into a pint pot, and so it was done, though it often looked as if we were going to overflow.

The Naval Chain of Command.—As far as the actual assault was concerned the naval command problem was simple. Under the Allied Naval Commander in Chief, whose short title was ANCXF, were Rear Admiral Sir Philip Vian commanding the Eastern Task Force of British Forces and Rear Admiral Alan Kirk, United States Navy, commanding the Western Task Force of American Forces. Both Task Force Commanders had under them Rear Admirals or Commodores in command of each assault force or follow-up force.

A more difficult problem to settle was the demarcation of responsibility between ANCXF and the commander in chief of the home commands. This was solved by defining a limited area, which roughly covered the Bay of the Seine, for which ANCXF was directly responsible and leaving the commander in chief of the Home Ports responsible for

operations within their commands. It was further decided that on a date shortly before the invasion the Admiralty would turn over to ANCXF the general responsibility for overall direction and coordination of all operations within the channel.

The Softening of the Enemy's Coast Defenses.—The decision to attack in daylight called for such a heavy scale of bombardment of the enemy coast defenses as to dominate his resistance while the Army was landing. The plan allowed for this to be done in three ways. First, the enemy coast defense batteries were to be neutralized by air bombing before the landing was made, followed up by a period of bombardment by battleship, monitor and cruiser gunfire during the last stages before the touchdown. Secondly, a force of destroyers was to close the coast with each assault force and bombard at close range the enemy pillboxes and strongpoints commanding the actual beaches. A heavy air attack was also to be launched on the back of the beaches as the assault closed in. Thirdly and finally, each assault force was to contain its own fire power, and to this end new weapons were provided and a technique for their employment was developed, and they were trained simultaneously with the assault forces. Such were the DD tanks, the SP artillery fire from LCT, the Centaur and Challenger tanks mounted on platforms in LCT, and the use of rocket-carrying LCT and bomb-throwing LCA.

The Provision of Escort Forces.—We had to allow for counterattack by the enemy with destroyers, U-boats, E-boats and auxiliary craft. It was, moreover, not impossible that he might even move cruisers or heavy ships into the channel to repel the invasion. This last prospect never loomed large in our minds, but a plan was in existence to move an adequate naval force to the east in the channel to repel such an attack.

The real threats lay in the enemy U-boats and E-boats, and of these the E-boats were the more immediate, while the U-boats were the greatest potential threat. Counters to these were provided by a detailed and complicated mining plan which involved in its later stages the use of a new form of mine which we believed the enemy would be incapable of sweeping. But we could not rely only on mining for safety, and protection lay in the provision of adequate covering forces and of close escort to every convoy moving across the channel. For a counter to the U-boat we were also able to rely on the provision of a considerable air effort by Coastal Command, and this was further backed by the employment of antisubmarine escort groups in the approaches to the channel.

In the end, the forces involved included ninety-three destroyers, fifteen sloops, twenty-six escort destroyers, twenty-seven frigates and seventy-one corvettes. This was the price we had to pay for comparative safety against U-boat and E-boat attack.

Minesweeping.—We were never in any doubt that minesweeping would present us with one of our biggest headaches. We knew from the start that we should have to sweep a passage through the old mid-channel German minefield. This involved the simultaneous sweeping and buoying of ten parallel channels—the largest single minesweeping operation ever yet undertaken.

As D-day approached, intelligence indicated that the enemy was extending his use of defensive minefields off the French coast and this involved most complicated minesweeping plans for clearing areas for the deployment of our assault forces and for the bombarding ships to occupy. Further, at this stage the enemy increased his aircraft and E-boat minelaying activity in our own coastal waters and the problem of keeping our coastal channels swept was one that caused us keen anxiety.

Security and Measures to Mislead the Enemy.—By artificial radio traffic, the use of dummy landing craft in east coast harbors, and in every other way which imagination could evolve, the enemy was led to expect assault in the Pas de Calais area. Among these efforts to deceive the enemy I must also include a naval diversion employing light craft which was carried out on the night before D-day in the Straits of Dover in support of an air bombardment in the

Pas de Calais area. These craft were intended to give a radar effect of a large number of ships. A similar diversion was also carried out on the same night in the Cap d'Antifer area to deceive the enemy over the width of the front on which we were assaulting and to tie down his reserves. All these measures met with a truly astonishing success.

The Selection of H-hour and D-day.—I have already indicated that we were planning for a daylight assault with a cross-channel passage in full moonlight. The original intention was to land about three hours before the top of high water in order to give the maximum disembarkation on the rising tide without too great a distance for the initial assault to cover on the gunfire-swept beaches. Conditions of light and tide would only serve for three days in each full moon period.

We found, however, as the Spring passed, a new difficulty arising. Photographs of the beaches showed that the Germans were covering them with various forms of beach obstacles. Trials showed that the best way of tackling these was to land below them and clear them dryshod. This called for a landing shortly after low water but this in turn was affected by off-shore rocks in the approaches to one of the British beaches which did not cover sufficiently until about half-tide. In the end we had to compromise and accept the complication of different H-hours for the five beaches, the overall variation being sixty-five minutes.

The Assault.—With the order "Go," the whole Coast of England from the Humber to the Bristol Channel sprang to life and activity, and upwards of 6,000 ships and craft of every shape, size and description started to move to the complicated program laid down.

As the whole vast Armada started to converge on and steam down the channels swept by the minesweepers just ahead of them, it became more and more evident that we had achieved tactical surprise. It was not until the early hours of 6 June that the enemy began to realize that the great day was upon him.

The weather made the cross-channel passage of the expedition a difficult and very uncomfortable business. As the night of 5-6 June passed, it became evident that the hoped for improvement in the weather was not fully materializing and conditions were severe. A few of the landing craft foundered while others broke down. But with these few exceptions the assault went forward in close compliance with the plan.

Force "O," the Eastern American Assault Force, undoubtedly met the stiffest opposition and had the hardest battle to get ashore and to get established. On this beach the heavy bomber effort went astray and a determined enemy was present in strength. As a slight set-off to this, the Western American force achieved almost complete surprise, and, having a lee from the westerly weather, had easier going than the other forces.

On the Eastern Flank the enemy made his only naval attempt to interfere with the operations and sent out a force of torpedo boats and trawlers. Torpedoes were fired from behind the smoke laid to screen this flotilla from the Le Havre batteries and one of our destroyers—a Norwegian, was hit and sunk, but the enemy was quickly repelled by the guns of the Bombarding Squadron.

The Build-Up.—We had always visualized our job under two main headings: the first, to put the Army ashore fighting fit, in the right place and at the right time; the second, to land reinforcements and stores to meet military requirements. Space will not permit any account of the vast and complicated convoy schedule worked out to put this program into execution, but it can be fairly said that we kept to our promises and were never badly adrift. As an example of the scale of the work involved there were eight daily convoys outward bound—four to the British and four to the American area. On an average day during the first week the following ships and craft arrived off the assault area: twenty-five Liberty ships, thirty-eight Coasters, forty LSTs, seventy-five LCTs, nine Personnel ships and twenty LCI(L)s.

D+1 was a day of bad weather but it was followed by a week of improved conditions and things speeded up to such an extent that

by D+9 half a million men, and 77,000 vehicles, had been landed. The millionth man landed on D+28.

Defense of the Assault Area.—For the immediate defense of the assault area both Task Force Commanders relied on a so-called static defense to cover the mass of ships and craft at anchor off the beaches. In the British area by night a line of minesweepers was anchored six miles offshore and parallel to the coast with ships five cables apart. The Eastern flank was guarded by support landing craft anchored one cable apart. To reinforce these ships there were two or three sub-divisions of destroyers on patrol to seaward and two or three divisions of MTB's stopped but under weigh and northeastward of the eastern flank. This scheme of protection was designed to reduce mutual interference to a minimum and a generally similar scheme was employed in the American area.

The enemy made many attempts to penetrate this defense both with torpedo boats and E-boats, but it proved its value and he had no success. It was later equally successful in repelling attack by midget submarines and human torpedoes. The cross-channel routes were covered by destroyer and MTB patrols operated from the Portsmouth Command, and these achieved remarkable success in routing enemy attack. Some casualties inevitably there were, but whenever and wherever the enemy appeared he was fought and generally damaged and defeated.

The primary defense against air attack lay in the continuous fighter protection flown over the Assault Area. Indeed rigid restrictions were imposed on gunfire from ships and craft.

As far as the U-boats were concerned the main defense was a distant one and we relied largely on the efforts of our surface ship hunting groups working in cooperation with Coastal Command in channel soundings. Our trust was amply justified as the U-boats were severely harried and suffered heavy loss. They were so shaken by the time they reached the cross-channel traffic that they never proved a serious menace.

Subsequent Operations.—With the rap thrust towards the Low Countries, which d livered Antwerp into our hands practicall undamaged, the Naval Staff at once concen trated on the problem of opening up th Scheldt. Here was at last what we had longe for—a major port capable of competing i full with military requirements. But we wer faced with the fact that we could not begi the big minesweeping operations to clear th river until the Army had cleared the enem out of the coast defenses covering the a proaches to the river. The date of the oper tion was, therefore, dependent on the spe with which the Army advanced along th coast, and it was not until the end of Octob that a combined operation could be stag to seize the island of Walcheren and to cle the northern bank of the Scheldt.

The general plan was to clear the mai land by military operations and then to as sault the island of Walcheren simultaneousl from the east, south and west, having firs neutralized the fixed and heavy defenses o the island by flooding, which was to be effecte by bombing the sea dikes. Gun support wa to be supplied by a battleship and tw monitors, while close support was to be give by support landing craft and Rocket LCT' Under this cover our Commandos were t land at West Kapelle. The assault wa planned for 1 November—the first date o which the tide suited.

Minesweeping was commenced the momen the enemy's defenses were dominated and b 26 November the river was sufficiently clea to allow the first ships to enter Antwerp

With the opening of Antwerp the Nav was faced with a new task since the Army supply route had to be protected not onl against E-boat attack from bases in north ern Dutch ports but also against the enemy steadily increasing use of midget submarine To these the Scheldt approaches offered a ideal happy hunting ground. We did not ge off without casualties, but it can fairly b claimed that the enemy's countermeasure were held, and damage and casualties wer inflicted on him on a scale adequate to blun the edge of his enthusiasm for the attack

Ground Missiles vs. Ships and Planes

Translated and digested at the Command and Staff College from an article in French by Camille Rougeron in "Revue de Défense Nationale" February 1946.

THE war in the Far East, at the time when the Japanese were extending their domination from the Philippines to New Guinea, proved the extreme ease with which landing operations could be carried out when naval and air supremacy were combined in the same hands. The "Atlantic Wall," and the islands of Okinawa and Iwo Jima were equal to the best of fortified lines, but naval artillery and aerial bombs crushed the best of defenses and stopped the most resolute of armored counter-attacks. Never has a defender been more helpless in the face of naval fire or aerial bombs.

Guided Missiles in the Defense

At the time of the first bombing of England by V-1, the propaganda agencies of the Reich gave lengthy descriptions of the terrific destruction of Allied convoys in the middle of the Channel by the flying bombs. Would not the stocks of V-1 bombs provide an effective defense against a possible Allied invasion? Surely, they reasoned, the use of these bombs would frustrate any attack on the Atlantic Wall.

Subsequent events, however, did not bear out the German claims and the Normandy landing was much more interfered with by interdiction fire on the beaches than by the flying bombs.

However, even though the experiences of war bring us no proof of the effectiveness of guided missiles against combined air and sea operations, it would nevertheless be a mistake to conclude that they will not, occupy an important place in the future. Germany went down at a time when new weapons in course of development were about to make their appearance. Experimental models seized at research centers, and the results of trials, leave no doubt as to their significance. Then too, the United States Army and Navy have announced the introduction of similar guided missiles. Ships as well as aircraft will have to reckon with them in the future.

They would certainly be economical for use against large ships, and nations which border on narrow seas will probably have weapons capable of covering the entire surface of those seas. The master of the European coasts could have all the routes of approach to the British Isles, as well as the entire Mediterranean, under his fire. Cargoes in the Baltic could be reached by means of projectiles fired from England, and in the Adriatic or Aegean seas by those launched from Malta.

Long-range weapons may be employed without any arrangement for the correction of their trajectory while in flight, and results are satisfactory when the target area contains a large number of important objectives. An arrangement permitting correction of direction while in flight augments the chances of a hit without increasing the weight or cost of the projectile to any excessive degree. Such an arrangement is almost certain to be used against objectives that are extremely dispersed and maneuvered, as will be the case with naval and air formations that have at some time been subjected to this sort of air attack.

Two Types of Missiles

Two types of guided missiles have already been constructed and employed by Germany. The remotely controlled device was first dropped from an airplane and controlled by apparatus placed out of range of defensive fires. The first results of its employment against Allied naval forces in the Mediterranean, were satisfactory. But a defense was quickly found against an enemy who did not possess air supremacy, in the form of a fighter escort numerous enough to keep the enemy bombers at a distance.

Employed by long-range weapons directed from the ground, remote control is much more satisfactory. Electric-magnetic detection does away with the necessity for seeing either the target or the weapon, or for being in a position from which one is able to judge error in direction and the correction required.

The control of a weapon while in flight, either by means of an operator who sees both weapon and target or by means of an automatic mechanism which guides the weapon to the target without manual intervention, is certainly evolutionary in military technique, but we should avoid concluding from this that it will be impossible, in the future, for ships and planes to escape destruction. A remotely controlled weapon or one that is guided automatically, will no more destroy every floating or flying target than a dive bomber or a fighter plane can destroy a large ship or plane with certainty. Tests made with German weapons proved that torpedoes that were acoustically controlled missed their targets just as others had, and the first of the remotely controlled flying bombs employed in the Mediterranean against Allied ships rarely hit them. However, these weapons will be improved and their general use will call for improved methods of defense by naval and air forces.

Defense Against Guided Missiles

Two methods of defense can be used—fire, and evading maneuvers. Why should not fire, which is highly effective against piloted devices also be effective against pilotless ones? As a matter of fact, V-1's were brought down in large numbers by antiaircraft defense and fighter aircraft. The speed of the V-1, inferior to that of the latest pursuit aircraft and whose capacity for maneuver it lacked, condemned it to almost certain destruction as soon as the sights of the defender were trained on it.

Pilotless weapons, if they are not to be destroyed *en masse*, must clearly exceed the speed of sound, and they are able to do this much more easily than the planes whose mission it will be to intercept them. It has not been reported that a single V-2—which meets these conditions—was ever shot down by fighter aircraft or artillery, in spite of the ease with which they could be detected.

The effectiveness of evading maneuvers depends on the speed of the projectile and on the maneuverability of the target. Until 1914 the large vessel had no chance of escaping from artillery fire by maneuver. It was n that these ships did not move several lengt during the projectiles' time of flight, but t ship could not modify its course or its spe with the necessary rapidity.

The situation is entirely different for ve small ships or planes which are attacked high speed weapons. In the case of a lar number of targets, ranging from the laun and midget submarine to small or mediu plane, evasive maneuver is the surest defen against remote-controlled or automat weapons whose lack of capacity for maneuv will be their weak point. Thus, it is not their fire power but in their capacity f maneuver that the air and naval equipme of tomorrow will find its best defense.

The effect of the atomic bomb on the ev lution of naval equipment leads, from t standpoint of defense, to seeking on the se a dispersion analogous to that which is such value on land. And here, the dispersio can only be one of tonnage and will b achieved by using ships of small or mediu tonnage. The concept of protection must b completely revised. Ships of large tonna which are effective against perforating pr jectiles, are of no value. The ships and plan of the atomic era will be of minimum volum which a thin armor (if this term may b used for the 100 millimeters with which t engine compartments of the 100-ton laun could be covered) would protect against bla and fragments. Against the direct impact flying bombs weighing several tons and tra eling at the rate of 1,500 meters per secon thick armor is useless. It is even disadva tageous, since it interferes with evasi maneuver, which is the only chance of avoi ing a hit.

In the middle of the Atlantic and Pacif 45,000-ton battleships and super-bombi planes carrying thirty-ton bombs will pe haps be able to conform to the classical co ception of power, armament, protection a speed, but as soon as they approach the con the long-range weapons that will greet th will teach them the importance of an ad tional factor, which has been too l neglected: maneuverability.